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COMPUTERWORLD

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Speedy PS/2s: There's the beef

Flashy new machines may not entice wary users into Micro Channel fold

BY ALAN J. RYAN
CW STAFF

NEW YORK — IBM shored up its Personal System/2 line last week with models that turned corporate users' heads but may still not be enough to convince them to embrace IBM's controversial Micro Channel architecture.

In an unveiling here, IBM filled the gaps in its PS/2 family with three versions of the long-rumored Model 70 386, a desktop unit based on Intel Corp. 80386 processors boasting clock speeds of 25, 20 and 16 MHz.

Also announced were two versions of the PS/2 Model 50 Z: a zero-wait-state 10-MHz machine offering standard higher capacity disk drives than the current Model 50 and local-area network versions of the low-end Intel 8086-based Model 25.

Despite the broadened line, the Micro Channel remains "an investment in the future," said Art Skopec, a senior personal computer analyst at the Memorial Sloan-Kettering Cancer Center in New York. "But we don't know what will be out in a year or two. The future might require faster transfer rates than the current machines can accommodate." Skopec said he will delay his purchases until the picture is complete.

"Right now, there is no operating system out there that really takes advantage of what the Micro Channel will eventually offer us," he added.

Inside

- Old Model 50 disk drives go on your shelf. Page 7.
- LAN connection seen as attempt to extend life of 8086-based technology. Page 6.

Prudent approach

IBM's use of the 25-MHz processor made an impression, however. "The Model 80 is already fast; [the Model 70 25-MHz] is going to be a screamer," said Alan Loebel, a staff consultant who makes PC purchase recommendations at Harris Corp.

But Harris has not yet signed on to the Micro Channel architecture for its computing needs, although it is considering doing so, according to Loebel.

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Silverlake to get SAA infusion

BY J. A. SAVAGE
and ROSEMARY HAMILTON
CW STAFF

Future IBM Silverlake users who want to build portability into their software should consider developing applications in the C programming language or Cobol 85.

According to several IBM mid-range users and analysts, IBM will offer C and Cobol 85 as well as RPG on its mid-range successor to the System/36 and 38, which is expected to be announced later this month.

Those options will give Silverlake users the opportunity to later move up to an IBM 370 mainframe and take their applications with them. IBM's customers have for years faced severe problems moving between or away from the dual mid-range platforms.

At the same time, future Silverlake users will gain the option of distributing applications between mid-range and microcom-

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Perot's calling card has familiar look

BY CLINTON WILDER
CW STAFF

WASHINGTON, D.C. — H. Ross Perot, the Texas billionaire and founder of Electronic Data Systems Corp., has wasted no time in re-entering the computer services industry he helped create.

Exactly one day after the expiration of his noncompete agreement with General Motors Corp. last week, Perot announced the formation of Perot Systems Corp., a private firm that will seek federal government computer services contracts. He also announced the hiring of eight former EDS executives and a $500,000 contract from the U.S. Postal Service.

"He moves pretty quickly, doesn't he?" said Stephen McClellan, vice-president of securities research at Merrill Lynch Capital Markets. "This could potentially compete with everyone doing systems integration and professional services for the federal government. But that's years down the road, when it's big enough."

Perot is enjoined from making any profits in the data services business until December 1989 — three years after GM's board engineered his stormy departure with a controversial $750 million stock buy-out. But the noncompete clause Perot signed at that

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Grand scheme looming as grand delusion

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — It was back in December 1980, when there were still 52 American hostages in Iran, that President Jimmy Carter launched a bold experiment in information management.

The beleaguered president, in one of his last acts in office, signed a law requiring federal agencies to implement a trend-setting concept called information resources management — the precursor to today's notion of chief information officers.

But seven years later, it appears that the IRM experiment is in danger of fizzling out, according to federal managers and analysts. In fact, federal implementation of the IRM model is said to be woefully incomplete, and some disillusioned agencies have started to dismantle their IRM operations.

"These buzzwords go through a life cycle. Systems integration is at the beginning, and IRM is near the end," said Robert V. Head, a former IRM official at the U.S. Department of Agriculture.

Although all agencies have an IRM officer, as the law requires, IRM has become merely a new name for traditional data processing operations, according to three-quarters of the federal IRM managers surveyed last year by Sharon L. Caudle for the National Academy of Public Administration in

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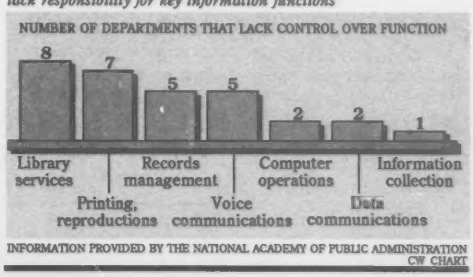
Something missing

A survey of 16 federal departments' IRM groups shows that many lack responsibility for key information functions



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Quotable

"All the announcements from computer vendors say they are 'fully committed to the concept of ISDN,' which is the same as saying they are fully committed to the concept of gravity."

MICHAEL FINNERAN
DBRN ASSOCIATES, INC.

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Ex-CEO arraigned

Psychiatric tests ordered for Massdata founder

BY NELL MARGOLIS
CW STAFF

Tex Zachary Hildreth, the 24-year-old computer entrepreneur who attempted suicide late last month after his apparently skyrocketing software company disintegrated into a shambles of debt, is undergoing a court-ordered 10-day psychiatric evaluation at Medfield State Hospital in Massachusetts.

Hildreth last week pleaded not guilty to charges of larceny during arraignment at Massachusetts' Quincy District Court. A hearing on the larceny charge — brought on the basis of a private individual's claim that she was bilked by Hildreth, and thus far the only criminal action pending against the founder and ex-chief executive officer of Braintree, Mass.-based Massdata Corp. — is set for June 10.

The 10-day commitment came as a compromise between the prosecution's alternate request for a 20-day psychiatric evaluation or $200,000 bail and the request of Hildreth's attorney, Gregory Sullivan, that his client be released on his own recognizance in light of his clean past as a hometown boy with no legal record.

Sullivan said he initially opposed the prosecutor's psychiatric evaluation request after a court-appointed psychologist who interviewed Hildreth immediately prior to the hearing reportedly found him rational, intelligent and showing no signs of mental illness.

End of the line

"As far as I know, Massdata is no more," said John Spence, chairman of Rockland Trust Co., which foreclosed against Massdata last month in an effort to collect $416,000 worth of outstanding secured business loans. "The offices are closed up; the assets will be sold as soon as possible. I think that this company is just going to disappear."

Reflecting on the fate of Massdata, Spence struck a note of ironic regret. During the past weeks, he said, he has talked to a number of former Massdata customers — all satisfied.

"When it came to the quality of their work," he noted, "everybody had very nice things to say. It's a shame that they couldn't just keep it together and go on doing what sounds like a fine job."

One source close to Massdata earlier reported a plan among employees to revive the company without Hildreth. The former Massdata employees in question could not be reached for comment.

"They well might get together and form another company," Spence said, "but I don't think they're going to revive Massdata."

California lottery goes bust

BY KATHY CHIN LEONG
CW STAFF

A severed MCI fiber-optic T1 cable brought down the Northern California portion of the state lottery network late last week, frustrating thousands of lottery players anxious to win the state's largest jackpot ever — $26.1 million.

According to MCI Communications Corp. officials, a construction worker accidentally sliced the underground 1¼-in. thick fiber while grading the roadside. The cable represented the line that carried traffic from the terminals in the northern half of the state to a hub MCI switch in nearby Hayward.

When the line was cut at approximately 10 a.m., the 1,538 lottery terminals in San Francisco and surrounding cities went dead. The custom terminals from Providence, R.I.-based Gtech Corp. went back on-line gradually in about four hours.

Pacific Bell and AT&T had used AT&T lines to route the lottery data to Sacramento. According to lottery officials, no data was lost.

Place your bets

Meanwhile, anxious bettors, knowing that the pot was worth more than $26 million, waited for hours in long lines to purchase tickets in grocery stores, drug stores and shopping malls. Officials said they could not estimate how much money in lottery sales was lost during that time. However, the spokesman did stress that amid the turmoil, the lottery had its largest sales ever of $19.1 million.

Lottery officials said this was the first such occurrence to the computer network, which is said to handle more than 6 million transactions during a single day of play.

The same MCI fiber-optic line carried voice service for some 200,000 MCI customers, who received a steady stream of busy signals throughout the afternoon of the disruption, according to an MCI spokeswoman.

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DEC OLTP almost ready to roll

BY NELL MARGOLIS
CW STAFF

As the industry awaits IBM's assault on the mid-range, the traditional mid-range turf boss is readying itself to take to higher ground.

Digital Equipment Corp.'s imminent "major announcement in [on-line] transaction processing," which was promised by Chief Executive Officer Ken Olsen at an April press conference and originally rumored to be set for mid-May, is now on target for mid-July, according to industry analysts.

"This is a defensive product in that DEC has got to have it; they're not going to release it before it really works, and probably not until they've got it working in a Vaxcluster," said Paul Zorfass, director of computing research at The Yankee Group in Boston.

A source very familiar with the product last week reported no unforeseen delays or major problems with the software, known as the Decintact transaction processing monitor, which he described as "pretty well along."

Reportedly a melding of two existing software products — Intact, a batch and interactive terminal, file and network management system from Advanced Systems Concepts, Inc. in Hoboken, N.J.; and DEC's Application Control and Management System — the software is widely expected to lie at the heart of DEC's forthcoming on-line transaction processing offering.

Bogus bulletin

While not yet officially announced, Decintact was recently listed in — and hastily withdrawn from — the DEC Electronic Store, an on-line product information facility that generally lists only announced offerings.

During its brief shelf life, the product was described by the vendor as providing "a foundation for building simple and complex transaction processing applications on one or more VAX systems under the VAX/VMS operating system."

Calling the software "a really comprehensive transaction processing product," the source familiar with it singled out Decintact's integration with DEC's relational data base, RDB, and the product's security and integrity features for particular praise.

"DEC is going to make a lot of money on this one," he predicted.

Not many ready to catch OSI wave

BY PATRICIA KEEFE
CW STAFF

BALTIMORE — About 8,000 attendees are expected to catch the OSI wave here this week at the Enterprise Networking Event (ENE), at which they will get a first-hand look at open systems connectivity in action.

But behind all the glitz and hype promoting this year as a watershed for user migration to standards-based open systems, few companies beyond a pioneering elite seem ready or inclined to tap its potential.

Users are expected to come away from the much-ballyhooed event with lots of technical information, product migration strategies and a better idea of what international standards can do, but promises and demonstrations are said to be a poor substitute for the touch and feel of off-the-shelf products, few of which will be available.

"I want to meet with the people participating and talk about their software and products to see what's available and what's coming," said Robert Duran, manager of Factory Information Systems at Chrysler Corp.'s Outer Drive Manufacturing Technical Center. However, he had no delusions about what he is going to see. "The feeling I'm getting is that not many products will be available."

But what is unique about this unusual show of vendor camaraderie, cosponsored by the Society of Manufacturing Engineers and the Corporation for Open Systems, is the on-site simulation of factory automation. It gives users an unusual opportunity to see what types of applications are suited to international standards, such as Manufacturing Automation Protocol/Technical and Office Protocol, CCITT's X.400 message-handling system and X.25 wide-area networking protocol support and Open Systems Interconnect (OSI) services.

ENE's targeted audience is the so-called Fortune 900, specifically nonaerospace and -automotive companies.

But a number of industry analysts have exhibited less optimism, claiming a realistic watershed year for OSI might be 1989 but is more likely to occur in 1990 or 1991.

Money does not appear to be a major issue in adopting these standards. Some interested users will be blocked from taking action by fluctuating or incomplete standards and a dearth of products, particularly MAP 3.0, analysts said. Also daunting is the likelihood of incompatibilities between different implementations of standards, a situation that IBM, Hewlett-Packard Co. and Digital Equipment Corp. spokesmen recently readily conceded.

"Although we are committed to MAP and we have followed MAP very closely, we have not implemented either [MAP] Versions 2.0 or 2.1," Chrysler's Duran said. Why not MAP? "We haven't found it stable enough or cost-effective enough to this point in time to plan a production implementation," he said.

Beware

That is precisely why users should approach ENE with healthy skepticism, according to Bruce Richardson, an analyst at Advanced Manufacturing Research in Salem, Mass. He claimed the last demonstration of MAP technology, conducted at Autofact '84, filled users with a sense of false promises. "Users were seduced and abandoned," he said, claiming a lot of promises were made but not kept.

That user ambivalence permeated a recent study of 300 large user organizations. These users paid lip service to OSI migration plans while claiming to be satisfied with alternatives such as Transmission Control Protocol/Internet Protocol (TCP/IP), according to Infonetics, a consulting and market research firm in Santa Clara, Calif., whose survey examined attitudes toward TCP/IP and OSI.

"Our large enterprise users say they are moving to OSI, but their purchasing decisions don't follow. They're confused," said Infonetics President Thomas White.

Standard time in Baltimore

So you're leaning toward open systems architecture, but say you're holding out for real live products that support standards such as X.400, Open Systems Interconnect (OSI) and Manufacturing Automation Protocol? Has the Enterprise Networking Event (ENE) got products for you.

Most of the products slated for unveiling and demonstration at ENE this week will not exactly be available this year — in fact, many are not scheduled to ship for another six months — but at least attendees are guaranteed of a good rundown on what will be available down the road.

Beyond a nine-station demonstration of OSI, MAP and Technical and Office Protocol (TOP) products working in tandem to solve multivendor network problems, ENE is featuring products and migration strategies from 58 vendors and user companies committed to the seven-layer OSI model. A partial listing of scheduled announcements follows.

- **Unisys Corp.** has added X.400 and FTAM support to its BTOS X.25 and IBM Systems Network Architecture products and will detail plans to add support for token-ring 802.5, Unix (via Transmission Control Protocol/Internet Protocol) and OS/2 access under BTOS.
- **Hewlett-Packard Co.** will demonstrate its recently unveiled OSI Express — OSI on a board utilizing proprietary HP very large-scale integration chips; two X.400 software packages; an X.400 interface; standard manufacturing message specification and FTAM software; and a MAP protocol analyzer. The products will be available late this year or early next year.
- **Wang Laboratories, Inc.** will demonstrate several OSI-based products unveiled last week: Office/X.400 Gateway, which runs on Wang VS minicomputers and allows message exchange between Wang and other vendors' X.400-compliant products; VS WOSIS Core, which implements the network and transport OSI layers and provides management facilities; and VS WOSIS Transport and Session Services.
- **Retix Corp.** introduced the PC 300 wide-area network card, which can be used in combination with either Retix's OSI or X.25 protocols to link to networks supporting those standards.
- **Digital Equipment Corp.** will announce MAP 3.0 applications and its intent to support the Fiber Distributed Data Interface standard.
- **Control Data Corp.** will feature an X.400 interface for developing applications.
- **NCR Comten** will demonstrate Comten XC.25 Version 2 software, said to allow NCR Corp. hosts to act as a node on the X.25 network. X.400 capabilities will also be displayed.

PATRICIA KEEFE

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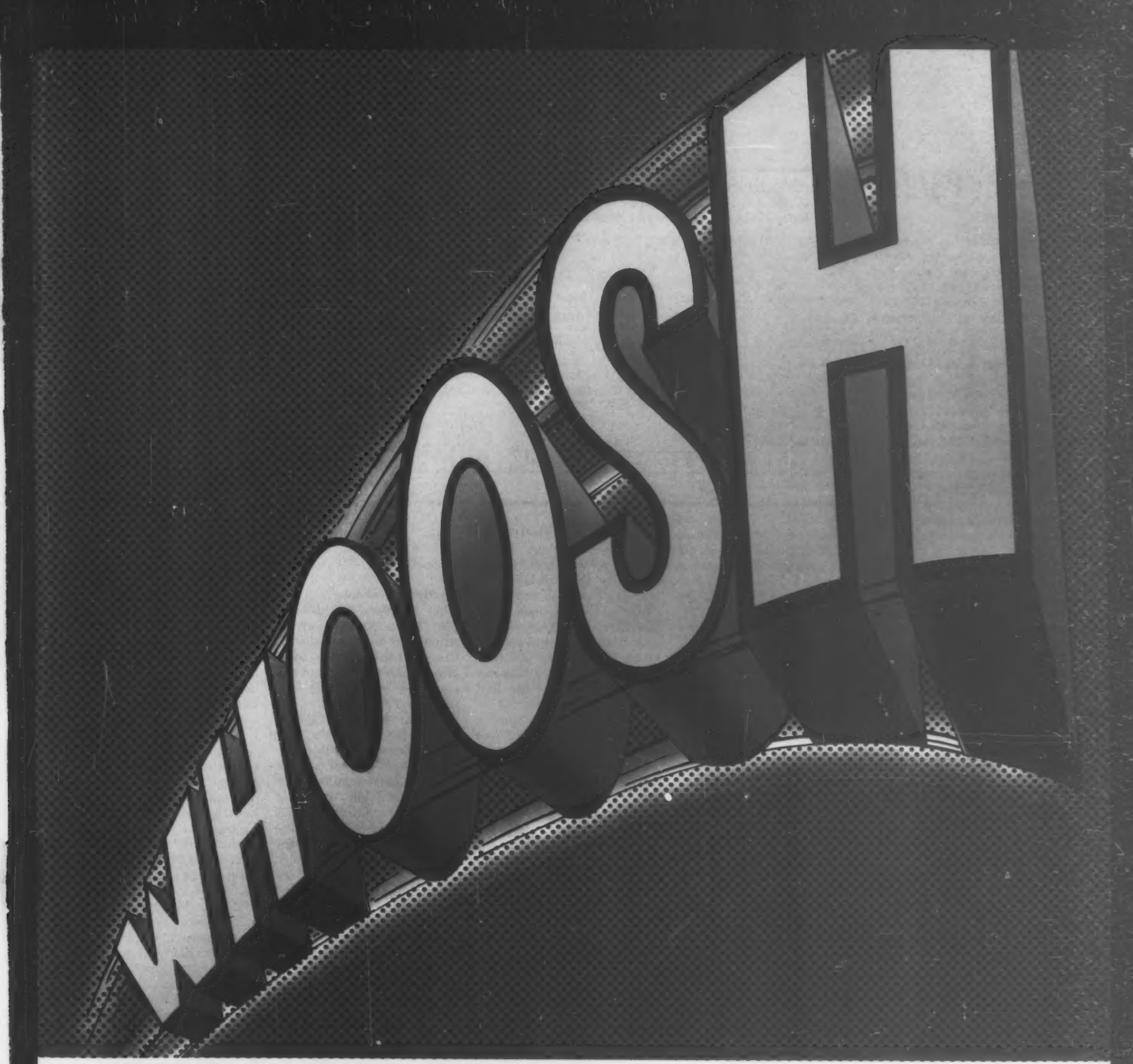

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Speedy PS/2s

FROM PAGE 1

Loebel said he has interest in the PS/2 line and the Micro Channel but will wait for networking standards that come about in the upcoming OS/2 Extended Edition before taking another look.

Something for everyone

Micro Channel or no, the breadth of IBM's offerings from the low-end Model PS/2 25s to the high-end Model 80s is showing a new kind of IBM, according to Cheryl Currid, manager of departmental computing at Coca-Cola Foods in Houston.

"There is something for everybody in the product line; they are becoming a more responsive company," she said.

At the announcement, IBM also rolled out fixed disk drive options, memory expansion options and a math coprocessor and announced price cuts on existing PS/2 Model 80s and 60s.

The price cuts put the Model 80-071 at the same $7,995 price as the Model 70-121. "The price difference between the 16-MHz Model 70 and the 16-MHz Model 80 is not that great, but the expansion is where the difference comes in," said Dennis Andrews, director of the Boca Raton Laboratory at IBM's Entry Systems Division. The PS/2 Model 70 has three expansion slots, while the Model 80 has seven.

Users said IBM's move into the desktop 386 market was overdue, but surprisingly, it has jumped in feetfirst by announcing the first 25-MHz 386-based desktop with memory caching.

"We clearly don't want to let ourselves be disadvantaged again," said Nick Donofrio, vice-president of development at the Entry Systems Division.

However, a faster clock is still limited by the peripherals attached to it, users pointed out.

The only disadvantage to the new IBM systems, users said, could be their pricing. A 25-MHz Model 70-A21 fully populated with 16M bytes of memory would cost $21,660, one IBM spokesman said.

The base Model 70s range in price from $5,995 to $11,295. The Model 50 Zs will cost between $3,995 and $4,595.

"It's about time that a Model 50 would actually join the ranks of acceptable speed, finally competing at the same level as other high-quality entrants in the fast 286 world," Skopec said. "But the pricing is still high — even at our discount, it is high for the base unit." He added that the Model 70 is expensive as well.

IBM's pricing could also mean certain death for its current Model 50, which costs just $400 less than the 30M-byte hard-disk Z model. "I think the Model 50 Z is a better deal, with zero-wait states," Currid said.

Some said the Model 50 upgrade was a necessary one. "I think the old Model 50 would not have really been sufficient to run OS/2," said Howard Fosdick, data base administrator at Amoco Corp.

Costly alternative

While the Model 25 LS's new IBM Token-Ring network PC adapter makes it more viable as a business tool, that is also considered a costly alternative to low-cost nodes on a network, users said.

Priced from $2,139 to $2,484, the PS/2 Model 25 is probably more costly than buying a cheaper diskless unit and adding in the Token-Ring, said Steve Wainwright, a project leader in charge of evaluating new equipment at Empire Blue Cross/Blue Shield in New York.

"If you're really going to go the network path, it doesn't pay you a lot to have duplicate storage," said John Crombe, a consultant at Major Micro Systems Software Development Co. in Huntington Woods, Mich.

What will it take for IBM to make the PS/2 more attractive? It depends on OS/2, whether its Extended Edition is hooked to the PS/2 and whether developers latch onto it, said G. Jeffrey Knepper, director of advanced technology-tax at Touche Ross & Co.

Expanded lineup

IBM broadened its desktop Personal System/2 series with three Model 70 versions based on Intel's 80386, a faster Model 50 and options for the Model 25

	Model 25 LS (with Token-Ring adapter)	Model 50 Z	Model 70 386		
Intel processor	8086	80286	80386	80386	80386
Clock speed	8 MHz	10 MHz	16 MHz	20 MHz	25 MHz
Memory	640K bytes	1M to 16M bytes	1M to 16M bytes	2M to 16M bytes	2M to 16M bytes
Storage	3½-in. 720K-byte diskette (20M-byte fixed-disk option)	3½-in. 1.44M-byte diskette, 30M- or 60M-byte fixed disk	60M-byte fixed disk	120M-byte fixed disk	120M-byte fixed disk
Number of expansion slots	Two	Three	Three	Three	Three
Price	$2,139 to $2,484	$3,995 to $4,595	$5,995	$7,995	$11,295

INFORMATION PROVIDED BY IBM
CW CHART

IBM introduces *models to its PS/2 line.*

Little hope at low end?

BY DOUGLAS BARNEY
CW STAFF

NEW YORK — The old Intel Corp. 8088 and 8086 architecture is dying in the corporate marketplace, and IBM's attempt to salvage it with Personal System/2 Model 25 upgrades will not change the inevitable, users said last week.

Even Model 25 upgrades *may not salvage the 8086.*

The Model 25 is at the very low end of the PS/2 line and is positioned as a low-cost node on a network and as an entry-level micro for homes and businesses. To boost its presence in both markets, IBM announced last week a 20M-byte hard disk drive option, along with the Model 25 LS, which is bundled with an IBM Token-Ring card.

But most large organizations, even those with a predominance of PS/2s, have outgrown the Model 25's aging processor.

"Hooking onto a LAN with a workstation that doesn't have enough horsepower to do the job won't be helpful," said G. Jeffrey Knepper, director of advanced technology-tax at Touche Ross & Co.

Others, however, envision a possible network role for the Model 25.

"For installations with a fairly large number of terminals, that would be an interesting option. I don't think it is a good long-term investment, but it would be a good short-term investment," said Cheryl Currid, manager of departmental computing at Coca-Cola Foods in Houston.

Alan Loebel, a staff consultant at Harris Corp., said he sees potential PS/2 Model 25 customers opting for the lower cost diskless workstations.

"You could have a diskless PC that is 8086-based for $500 to $600 per node and boot from the server," he said.

IBM has offered diskless Personal Computers to key accounts as part of special bids, but the company does not offer any diskless models for sale through its retail channel.

IBM picks up pace with PS/2 options

While the new Personal System/2s were hoarding the hype during IBM's microcomputer product rollouts in New York last week, there were announcements of some options and adapters that brought the number of products introduced for that line since last year to more than 100.

For the Intel Corp. 8086-based PS/2 Model 25, IBM announced a 20M-byte fixed disk drive with an adapter, which it said will sell for $795 and will be available in July. It will use the system's 8-in. expansion slot.

Another version of the 20M-byte drive that does not require an expansion slot will be available in the fourth quarter at the same price, IBM said.

Also announced was the zero- to 8M-byte Intel 80286 Expanded Memory Adapter/A, a 16-bit full-length circuit card sold without memory for $600 and expandable to 8M bytes for use with the PS/2 Models 50, 50 Z and 60. IBM said 0.05M-byte Memory Module Kits that will sell for $215 each and 2M-byte Memory Module Kits for $995 are also available. For the PS/2 Models 70 and 80, IBM introduced the $1,695 2M- to 8M-byte Intel 80386 Memory Expansion Option, which comes with 2M bytes of 85-nsec memory. Additional memory in increments of 1M byte is sold for $695; 2M bytes cost from $1,395 to $1,495.

IBM also announced an Intel 80387 math coprocessor to work with the 25-MHz Model 70-A21, which will sell for $2,395 and is slated to be available sometime in the third quarter.

For users seeking to upgrade the current PS/2 Model 50, the original fixed disk drive can be replaced with a 60M-byte drive with a 27-msec access time. It will sell for $1,695 and will be available in September, IBM said.

The New York hardware announcements also brought mention of a new version of a software product, the IBM C/2. Version 1.10, which is a replacement version of an earlier C compiler for the IBM Personal Computer and PS/2 families, will run and generate code under DOS and OS/2, IBM said.

ALAN J. RYAN

Compaq, IBM 80386 bout heats up

BY JULIE PITTA
and ED SCANNELL
CW STAFF

HOUSTON — In the latest game of catch-the-leader, Compaq Computer Corp. will pull alongside IBM by introducing a 25-MHz 80386. It is expected to pass the industry giant by rolling out a second system based on 80386 technology that could create a new class of less expensive 386 products.

Last week, IBM released its first Intel Corp. 80386-based desktop system, the 25-MHz Model 70, seen by many as an important platform for selling its OS/2 operating system and Presentation Manager operating environment. Compaq is expected to match IBM's Model 70 while pushing its edge with a new microcomputer based on Intel's P9 chip set.

The Compaq P9-based system will be the first microcomputer based on Intel's as-yet-unannounced chip set. Intel's P9 offers the processing power of the 386 on a 16-bit data path like its predecessor, the Intel 80286. Although the chip set will be priced along the lines of a 32-bit 80386, the design costs are cheaper so that systems vendors can offer 80386 power at close to 80286 prices.

P9-based systems will be able to run 32-bit software but at slower rates because of its 16-bit data path.

Look before you leap

Compaq, which also has a line of 80286-based systems, is expected to be cautious with the P9's pricing, however. Company officials fear that a cheap P9-based system could cannibalize the current 80286-based offerings, observers said.

To stay competitive, Compaq had held off on pricing its 25-MHz system until IBM announced its intentions. Beyond introducing a desktop 80386, IBM said it has reduced prices on its floor-mount versions (see story page 1).

Compaq reportedly will price the P9 system in the $3,500 range. Industry observers have said that based on the technology, such systems could be priced at less than $2,500.

Users have little awareness of Intel's P9 technology, something that Intel is expected to clarify when it joins Compaq in the June 20 announcement in New York. However, Compaq users — ever hungry for more power — said they would welcome the 25-MHz system, provided the price is right.

"We sure could use it," said Richard Gonzalez, manager of new business administration at Great-West Life Assurance Co. in Denver. "We need all the processing power that we can get."

Gonzalez said he would be willing to pay from $200 to $300 more than his current 20-MHz 80386 Compaq desktop systems, which range from $6,499 to $12,499, if clock speed is the only benefit. However, if the system offers additional features like improved storage capacity and disk access speeds, Gonzalez said he would spend more.

PS/2 speed contest pits Model 50 against 50 Z

BY DOUGLAS BARNEY
CW STAFF

NEW YORK — Last week, IBM solved the Personal System/2 Model 50's nagging problem of slow, 20M-byte hard disk drives with the release of faster and easily installable 30M- and 60M-byte drives. But with no trade-in policy, IBM created another headache — what to do with the old drives.

The Model 50 has been roundly criticized for its 80-msec, 20M-byte disk drive, considered by many users to be too small and too slow for the new wave of applications under OS/2, IBM and Microsoft Corp.'s operating system for the PS/2.

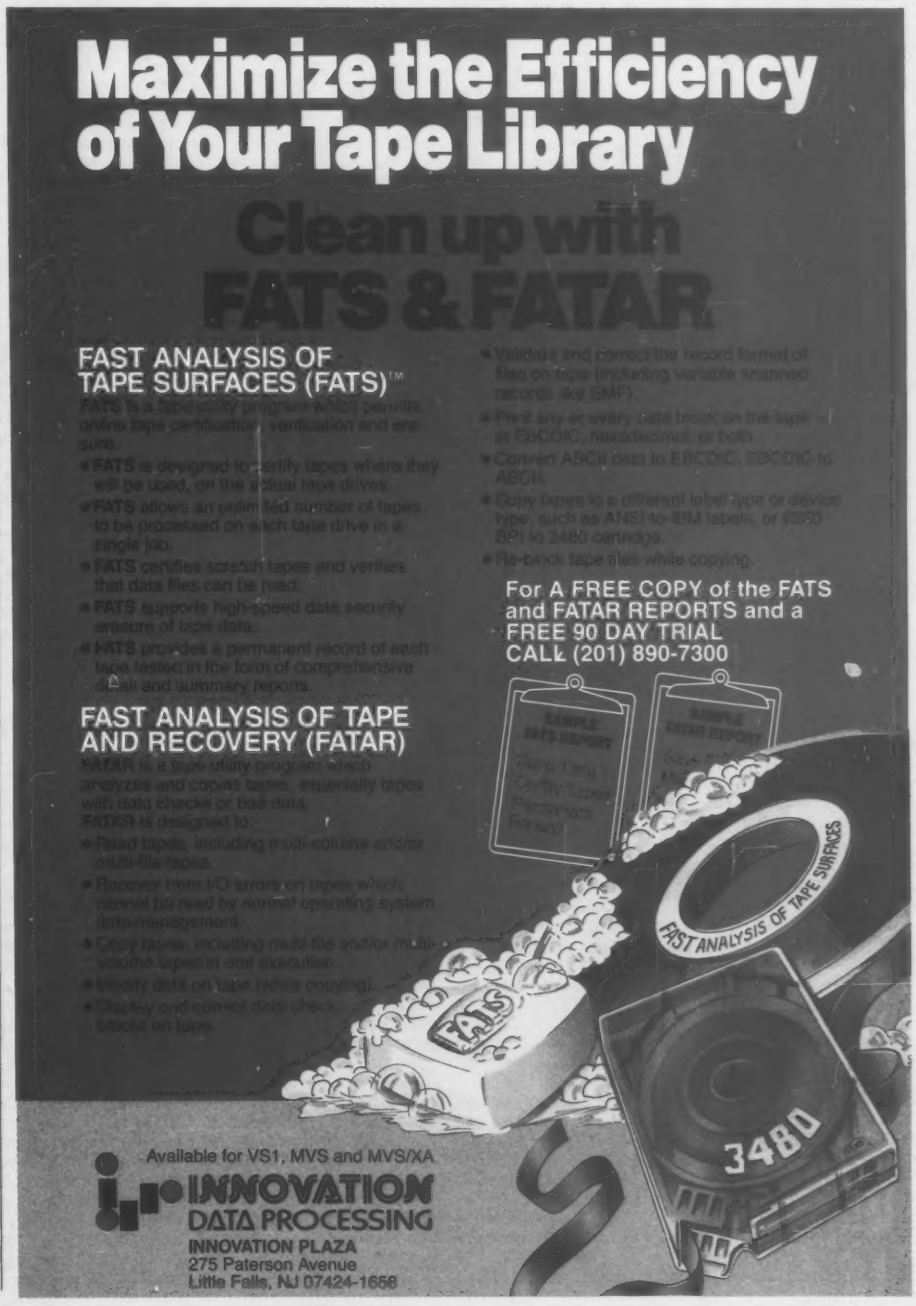
Both disk drives on the PS/2 Model 50 Z offer average seek times that are approximately three times as fast as the old drives.

But instead of a trade-in policy for users upgrading to the new drives, IBM officials suggested that users store the old drives and use them as backup in case the new ones fail.

That strategy, along with a price tag of almost $800 for the 30M-byte upgrade, did not sit well with Model 50 users. "Those prices are way out of line. I paid $800 for a Seagate 80M-byte hard disk," said Brian Camenker, executive director of the IBM PC Users Group in Boston.

The prospect of a pile of unused 20M-byte drives did not go over well, either. "Once it is pulled out, it is not going to go back into a machine except in the direst emergency, and then it probably won't serve your needs," said G. Jeffrey Knepper, director of advanced technology-tax at Touche Ross & Co.

For buyers of new machines, however, the Model 50 Z may hit the spot. "For general-purpose stuff like running Lotus, it would be nice to have a 50 with a bigger, faster disk," said Howard Fosdick, a data base administrator at Amoco Corp. "It sounds like a good announcement."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Groundwork to pay off for IBM's Silverlake

BY STANLEY GIBSON
and ROSEMARY HAMILTON
CW STAFF

For more than a year, IBM has whetted user anticipation for Silverlake, its hybrid follow-on to the System/36 and 38 lines. Now, two weeks before the expected launch of the mid-range line, that carefully laid groundwork has users poised to place early orders.

IBM's painstaking preparation contrasts sharply with other product launches, particularly the 9370's — IBM's other major mid-range offering — 1½ years ago. With the 9370 release, the product came first; the software required to make the product a success has since been straggling to market.

There appears to be little confusion among users about IBM's intentions this time. "We will go with Silverlake, and let's say I don't expect any surprises," said Dennis Klinger, vice-president of MIS at Ryder Systems, Inc.

Although many smaller System/36 and 38 shops said last week that they will put off a Silverlake purchase for at least two years, or until they require the additional functionality (see story this page), larger operations are eagerly awaiting the rollout.

In a series of interviews last week, Klinger and other current users of the System/36 and 38 family indicated their requirements:

- Relatively simple conversion of existing software to the new platform.
- More power and memory.
- The ability to reuse current System/36 and 38 terminals, storage devices and other peripherals.
- Better communications to personal computers and larger systems.
- The ability to migrate applications to IBM's Systems Application Architecture (SAA).

IBM has assured many of its customers through a number of briefings that their existing applications can be easily ported to the system.

The company also provided software houses with development information and access to processors for development [CW, April 11] and, in at least one case, helped complete a user's conversion before the processor's announcement.

The user, who requested anonymity, has been to Rochester, Minn., the Silverlake development location, to convert his software programs. Having completed conversion of most software, his shop expects to take delivery of a Silverlake machine early next month, he said.

The primary benefit for the user's shop will be the ability to support all its applications on one system instead of a System/36 and 38, as it has now. With all users on the same computer, communications between the two processors will no longer be necessary.

The user's shop will run System/36 and 38 programs on Silverlake at first in an applications mode; later they will be converted to Silverlake's reportedly SAA-compatible native mode.

It's sold

Another user is already planning to sell his System/36 and 38 and intends to place his order the day of the announcement. "It will simplify things greatly," he said, explaining that the System/36 has not been able to access jobs on the System/38. "This will make it transparent to the user."

An MIS director at a large retail firm said he has migrated to peripherals that IBM has said will be compatible with the new machine, phasing out 3370 disk drives in favor of 9335 subsystems. He said he believes his current terminals will work with the new systems. With the additional power that Silverlake will reportedly offer, the user said he hopes to reduce the number of systems from four to three.

His four System/38s are programmed using RPG III, the manager said, saying he has received assurance that he will be able to continue in a version of RPG with Silverlake. "I'm confident the migration will be smooth," he said.

Meanwhile, a number of developers, including the big software houses in the mainframe business, such as Management Science America, Inc. and McCormack & Dodge Corp., have reportedly been working closely with IBM to gear their mid-range software for the new platform.

With Silverlake, IBM appears to have been uncharacteristically generous in providing advance information. David Funderburke, director of information services at Trammell Crow Co. in Dallas, recalled last week that he accompanied his value-added reseller to a briefing in Rochester last November. Funderburke said IBM made several promises that the move to Silverlake would be a smooth procedure.

Thanks, but no

Content with their current systems, many smaller IBM System/38 and 36 shops said they will wait two years or more before taking the Silverlake plunge.

Based on a series of interviews last week, smaller System/36 and 38 shops will move to Silverlake either when they hit a capacity wall, which they expect will not be in the near future, or when IBM drops support for their current system.

"In three to five years, when we need an upgrade, then we'll talk to [IBM] about Silverlake," said Brian Gause, a systems programmer in the finance office of Horry County in Conway, S.C. Gause's department, which operates two System/38s, upgraded to Model 700s from Model 400s in the last week of May.

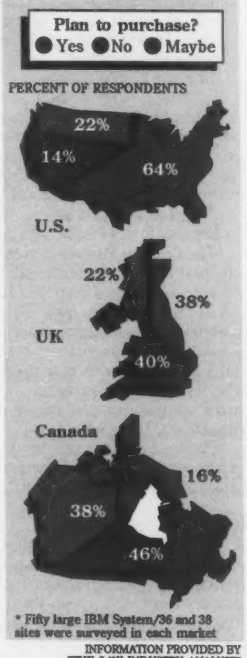
Other users said they cannot justify buying Silverlake simply to have a new system. "Committing to Silverlake now would be trading a known, quality product for an unknown just because IBM says it'll be better," said Clint Griggs, a programmer/analyst at the National Association of Letter Carriers in Washington, D.C.

Another System/38 shop, the Indian River Memorial Hospital in Vero Beach, Fla., said it plans to see how Silverlake performs before committing to it. "We're too dependent on this system," said director of DP Donald Isley of the two Model 700s he oversees. "We'd rather wait two or three years until it's proven."

ROSEMARY HAMILTON

Geographical differences

*Surveys in the U.S. and two foreign markets show that domestic users are more likely to buy IBM's anticipated Silverlake**



* Fifty large IBM System/36 and 38 sites were surveyed in each market

INFORMATION PROVIDED BY "THE S/3X INDUSTRY ANALYST"
CW CHART: AMY J. SWANSON

Silverlake

FROM PAGE 1

puter processors if they develop in Cobol or C, the observers said.

"Office applications will be developed in C and business applications and will be developed in Cobol," predicted Mark Webb, principal of New Direxxions, a mid-range consulting firm in Sanford, Fla.

The holder of a beta-test site manual for Silverlake claimed it lists Cobol and RPG as the languages that will be immediately available on Silverlake, along with Fortran, Pascal and PL/I. C is expected to be added soon after Silverlake's debut, according to the source, who requested anonymity. Fortran, Pascal and PL/I are already available on the mid-range machines.

Dennis Klinger, vice-president of MIS at Ryder Systems, Inc. in Miami, Fla., which is planning a project requiring 120 IBM mid-range machines, said his shop already does two-thirds of its development in Cobol for its System/36s. Klinger said his IBM representative has assured him that Cobol would be available as well as RPG on the Silverlake machine.

An IBM spokesman, Doug Griffin, manager of application enabling software marketing in Santa Teresa, Calif., said the languages offered on Silverlake will comply with IBM's Systems Application Architecture (SAA), which, in the case of Cobol, is ANSI-standard Cobol 85.

Big umbrella

Included under the SAA umbrella's designated programming languages thus far are Cobol 85, ANSI standard C and Fortran. By working with SAA-compliant products, IBM is telling its customers they will gain application portability across its hardware platforms.

The addition of Cobol 85 and C are intended to broadly strengthen the role of the System/36 and 38 follow-on as an integral member of IBM's SAA strategy, Griffin said.

IBM's original offering to run on Silverlake is expected to be an office automation package, written in C instead of PLS, a PL/1-like language used in IBM's current office automation system, Personal Services.

The application will not be available at the time of the introduction, since the software is not yet in alpha testing. It is expected by the end of 1989, sources indicated.

Really big

The new office automation package will be "huge," according to George Woodring, director of technical services at ADM, Inc., a mid-range consulting firm in Cheshire, Conn. "It will supersede Personal Services, merging graphics, images and words easily. It will include voice mail as well as electronic mail," he said.

The availability of C and Cobol 85 will have little appeal to many mid-range customers who have invested years of experience in RPG II and RPG III, the most widely used languages on those platforms.

Griffin would not specify what role will be played by RPG, the language used by an estimated 90% of System/36 and 38 users. However, a consultant briefed by IBM said Silverlake will also run two different versions of RPG, one that is SAA-compatible and another that is not.

One of the RPGs will be an extended version of the language that will let existing RPG II and RPG III applications run on the new processors, said David Andrews, president of ADM.

A separate subset of RPG will also be available that is compatible with SAA but will not support all applications.

"In order to get portability you'll have to tie one hand behind your back," Andrews commented, meaning that users will have to sacrifice some of the functions of the advanced RPG.

Sources said that the Silverlake version of RPG will dispense with Roman numeral designations and simply be referred to as "RPG." The subset of RPG that will run under SAA will have a different name. Both versions will support SQL statements within RPG programs.

But large users accustomed to writing in different languages for 370, System/36 and 38 processors may find the new languages present a choice. "[IBM] listened," said Ken Burk, senior vice-president of systems for Continental Insurance Co. in New York, who was briefed by IBM.

Burk's company has 250 System/36s as well as IBM mainframes. The staff writes applications in both RPG and Cobol.

Senior Editor Charles Babcock contributed to this report.

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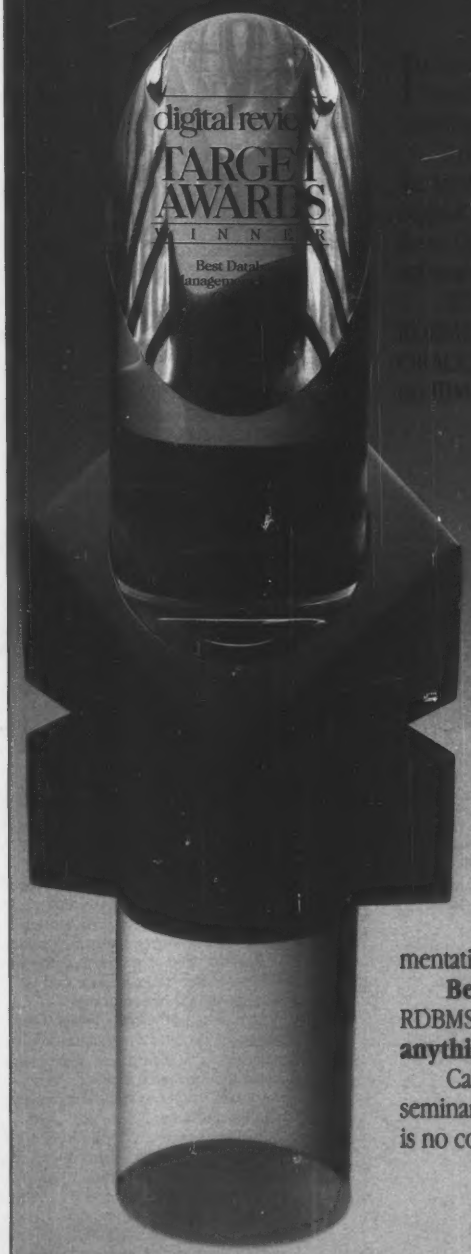

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IBM prepping super net

BY JEAN S. BOZMAN
CW STAFF

YORKTOWN HEIGHTS, N.Y. — IBM is creating a distributed supercomputer network that will further its research into supercomputing, semiconductor technology and parallel processing, spokesmen at the company's Thomas J. Watson Research Center here said last week.

"This network will be used to do very high-speed integrated circuit design," said Michael Connors, director of computing systems at the research center. "It will be used to prototype and experiment with various computer architectures, including supercomputers associated with parallel processors." The complex will also be available to IBM scientists for basic research in chemistry and physics, Connors added.

The IBM network will be built around a core of three IBM 3090 Model 600E computers, each having six Vector Facility processors. Conners said it will be operational by year's end.

Later additions to the network are slated to include a fourth 3090 in nearby Hawthorne, N.Y., as well as one in IBM's Center for Computational Chemistry in Almaden, Calif., and another in Switzerland at IBM's Zurich Research Laboratory.

"Our long-term objective is to design, develop and install a homogeneous supercomputer facility on a worldwide basis," Connors said. "We plan to expand this network substantially to maintain a leading-edge position in the development of IBM prototype products."

Machine for everyone

The network's homogeneous environment would allow remote researchers to access the complex as if it were their own machine, Connors said. Eventually, the supercomputer sites in the network will be linked by T1 lines and a high-speed optical communications network that will dramatically increase bandwidth, IBM said.

Although IBM plans to boost bandwidth to billions of bits per second, researchers will initially dial into the complex over 56K bit/sec. lines.

IBM's efforts seem to be geared toward establishing the 3090 with a Vector Facility as the single solution for enterprisewide computing, said Bob Trier, director of research at the Research Consortium, Inc., a Minneapolis supercomputer research group.

"IBM does not want to change its role as the provider of a total information solution," Trier said. "They would like to provide a general-purpose computer that also serves the need of a corporation's scientific and engineering end users."

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SCS to unveil 1.4G token-ring

BY JAMES DALY
CW STAFF

SAN DIEGO — Scientific Computer Systems Corp. (SCS) claimed it will drastically raise the networking speed limit in supercomputing environments today with the introduction of a token-ring networking scheme that boasts a data transfer rate of 1.4G bit/sec.

SCS Vice-President of Marketing Stephen Campbell said last week that the fiber-based Vectornet "runs more than 140 times faster than Ethernet and more than 14 times faster than recently announced 100M bit/sec. channels." He said it evolved because of current network communications rates, which are unable to handle the supercomputer's data transfer muscle.

"Vectornet could be very important if it works as promised," said Marcia Brooks, an analyst at International Data Corp., a Framingham, Mass.-based market research firm. "High-performance users are choking on the fact that they've got very powerful computers and yet can't get the data to move fast enough."

Two power sources

Vectornet derives power from the Vectornet Interface Processor (VIP) and the Vectornet Interface Adapter (VIA), which connects to the VIP.

The VIP communications processor allows Vectornet to connect to multivendor local-area networks, the firm said, and the VIA allows slower equipment to communicate with Vectornet, letting the local VIP processor remain dedicated to I/O and external gateway routing.

SCS also said the lower levels of the International Standards Organization communications standard are implemented within the intelligent protocol processor, which relieves the system of communications handshaking.

SCS spokesmen said the SCS-40 supercomputer, fully configured with Vectornet, is priced at $565,000; the VIP using copper wiring costs $50,000, $70,000 using fiber wiring; the VIA using copper wiring costs $20,000, $40,000 using fiber wiring. Peripheral controllers for the VIP cost $5,000 each. SCS said it will offer license rates as well as discounts for volume purchases.

Senior Editor Stanley Gibson contributed to this report.

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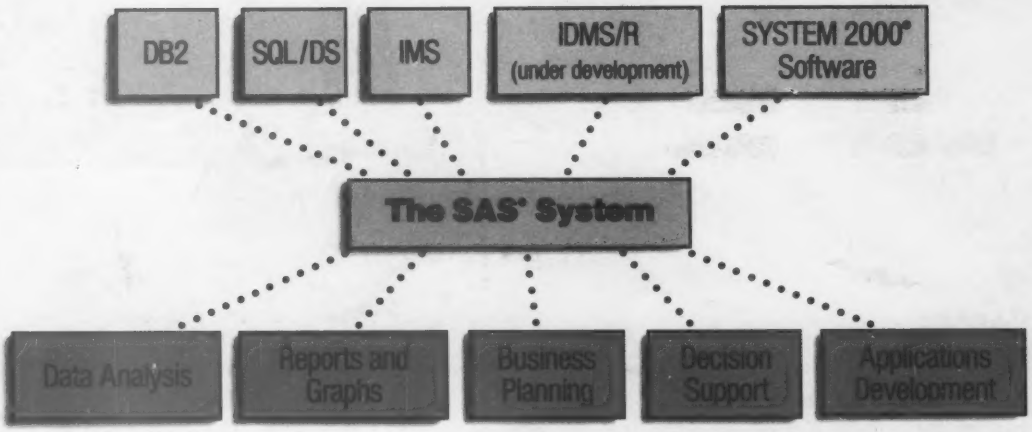

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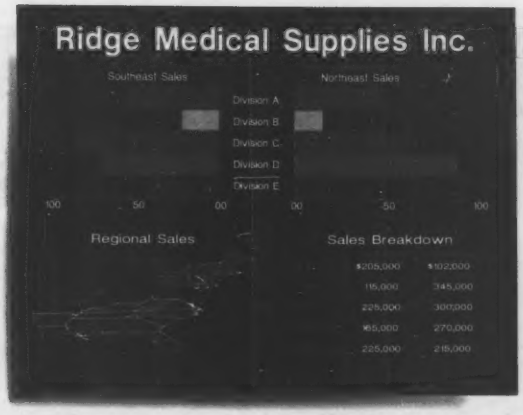

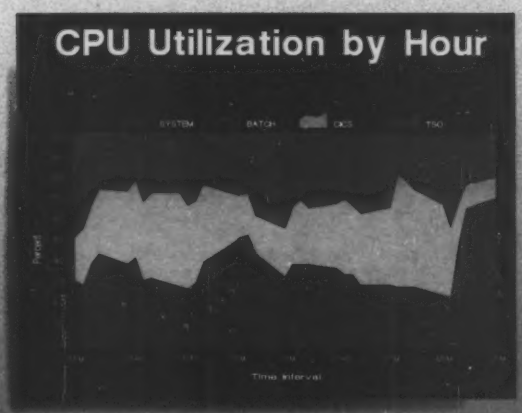

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Dell PS/2 clones short on substance

BY JULIE PITTA
CW STAFF

AUSTIN, Texas — Dell Computer Corp. beat the pack last April to introduce the first microcomputers compatible with the Micro Channel architecture of IBM's Personal System/2. However, Dell's PS/2 clones may be long on looks and short on functionality.

One potential obstacle that had been hovering in Dell's marketing path was removed with the announcement that it had reached a licensing agreement with IBM that apparently negates any legal threat to reproducing the PS/2.

Under the pact, Dell will pay royalties to IBM on its PS/2 line and will also make retroactive payments on IBM's Personal Computer line. Both Dell and IBM declined to offer specifics on the arrangement.

But with the legal issue behind Dell, what remains is to remove the technical obstacles blocking shipment of its own versions of the PS/2.

So far, Dell has shown its PS/2 prototypes twice — first at the mid-April launch and more recently at the Comdex/Spring '88 show in Atlanta.

Dell officials acknowledged last week that the two models shown at Comdex lacked completely functional components. "The controller boards are less than 100% functional," conceded David Srager, product manager for the System 400, one of Dell's two PS/2 compatibles. Western Digital Corp., Dell's supplier for PS/2-compatible controller boards, has experienced some technical difficulties in producing the components.

"They were prototype controller boards," Srager said. "Western Digital hasn't worked all the bugs out. We haven't worked all the bugs out."

Srager maintained that it is not unusual for a prototype to be less than perfect. He declined to offer specifics on other problems Dell is having with its new machines. Both systems will be ready to ship on schedule in the fourth quarter, he said.

Interactive backs OSF

BY KATHY CHIN LEONG
CW STAFF

SANTA MONICA, Calif. — Interactive Systems Corp. last week made an early leap to land on the alternate Unix bandwagon with the creation of a center to support the efforts of the Open Software Foundation (OSF).

Interactive, which has collaborated with IBM on its previous Unix offerings, is one of the first companies to take advantage of what it views as a potential gold mine represented by the recent alliance of vendors — including Digital Equipment Corp., IBM and Hewlett-Packard Co. — to develop a future version of Unix independent of AT&T.

"The industry will need to understand [IBM's] AIX and AT&T's Unix Version 3 along with the evolving directions of each system," said John White, Interactive's chief executive officer, in a prepared statement.

Working on AIX

White said Interactive is involved with IBM in developing AIX and has worked with AT&T on Unix System V, Release 3.

Interactive's new division, the Open Systems Technology Center, will be based in Boston and will offer support services to manufacturers and users working to understand the impact of OSF, the company said. It will also provide consulting services to those planning Unix strategies.

Slated to open next month, the division will sell software modules compatible with the future OSF version of Unix. The company already has a technology center focusing on Unix System V, Release 3 in Santa Monica.

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Microsoft, Apple ignore hatchet

BY STEPHEN JONES
CW STAFF

SAN FRANCISCO — There wasn't a lawyer in sight last week as Microsoft Corp. and Apple Computer, Inc. introduced a spate of Macintosh application upgrades and pledged unyielding support to each other's products.

Both companies reaffirmed the claim that Apple's pending copyright infringement suit against Microsoft for using Mac technology has had no effect on their cooperative development and marketing efforts. However, the legal entanglement that Apple started in March shows no sign of an amicable settlement.

"We obviously have a different point of view on the Mac [technology], but in the meantime, we're going to come out with several applications," Microsoft Chairman Bill Gates said. "Although we disagree with Apple over the lawsuit, we're firmly committed to the Mac."

Gates' comments were backed by announcements that Microsoft will ship upgraded versions of Word, Powerpoint, File and Excel.

The most significant enhancements were seen with Word 4.0 and Powerpoint 2.0.

The new Word package, set to ship in October, will feature a page view capability allowing users to get a full what-you-see-is-what-you-get representation of a document before it is printed. The program will also feature mail-merge capabilities and a user-definable keyboard enabling users to write their own personal types of commands.

Word 4.0 runs on any Macintosh but needs a Mac II to take advantage of color enhancements. It requires 512K bytes of random-access memory and two 800K-byte floppy drives or one hard disk. The price remains unchanged at $395, with an upgrade cost of $75.

Heat is on

Although Microsoft can claim the lion's share of the Macintosh word processor market, the developer is feeling pressure to keep users happy in the face of new competition. Recent entries from Wordperfect Corp. and Ashton-Tate Corp. have a good chance of nibbling away at Microsoft's impressive customer base.

One theme of last week's announcement was the integration of all Microsoft and Macintosh applications. Microsoft Mail, for example, can be accessed from within Word 4.0 without changing programs; Word imports and exports Excel, File and Powerpoint files.

"Microsoft is keeping the products strong and letting everyone know that you can use them all together — that's the best way to sell software," said David Perro, a software analyst at Dataquest, Inc. in San Jose, Calif.

Powerpoint 2.0, a desktop presentation program, is aimed at taking advantage of the Mac II's new color capabilities and costs $395.

A "color intelligence" capability offers built-in color schemes that match a foreground color with a series of background choices, eliminating any unwanted combinations. Powerpoint 2.0 is set to ship this month and will require a Macintosh Plus, SE or II; 1M byte of RAM; and two 800K-byte floppy drives or a hard disk.

Additions to the File 2.0 data base management program include 120 templates for use with preprinted forms, extensive color capabilities with the Mac II and improved merge features with Word. It is scheduled to ship in August for $195, with upgrades priced at $50.

Excel 1.5 received the lightest upgrade, with color support for the Mac II, multitasking under Apple's Multifinder operating environment and enhanced charting functions. The program is available now with no change to its $395 price. Upgrade cost is $25.

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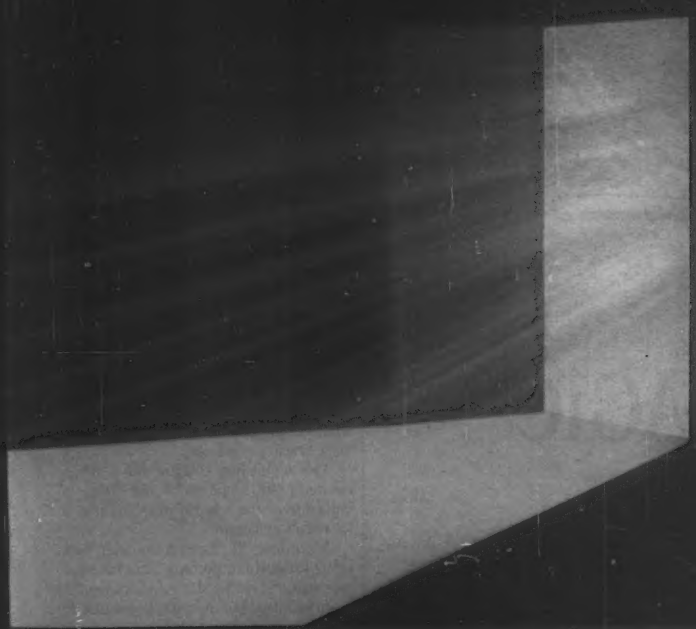

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Borland unleashes chameleon word processor

BY STEPHEN JONES
CW STAFF

SCOTTS VALLEY, Calif. — Borland International's Sprint word processor will emerge from the vaporware mists this week after more than a year since the product was first announced.

Sprint will be unveiled at a press conference in New York and will begin shipping in the next two to three weeks for $199, company officials said.

With a chameleon-like interface that can be changed to look like many current word processors, Borland hopes to win over users of industry-leading packages who want better performance but do not want to learn a new program.

That strategy has been a success with Borland's Quattro spreadsheet, which has been well received by users of Lotus Development Corp.'s 1-2-3 because it can be modified to look and feel like that popular program.

In addition to Sprint's interface, Borland said it will offer alternative interfaces that mirror the look of such word processing packages as Micropro International Corp.'s Wordstar, Wordperfect Corp.'s Wordperfect, Microsoft Corp.'s Word and Ashton-Tate Corp.'s Multimate.

After bundling six industry-leading interfaces free of charge with Sprint's initial shipments, Borland said it will sell the word processing package separately for $99.

Aiming to please

"We're not trying to copy the other guys, but we're coming in as a very late player, and we have to provide flexible user interfaces to satisfy current users," said Jonathan Prusky, a product manager for Sprint.

The software requires a minimum of 256K bytes of random-access memory, but Borland recommends 384K bytes. Sprint runs on DOS-based IBM Personal Computers and compatibles and requires two 800K-byte floppy disk drives or a hard disk.

Development delays and marketing plans slowed the release of Sprint while other companies were seizing market share in the character-based word processor arena. But one analyst said Borland still has a chance to make a rush at such industry leaders as Wordperfect and Ashton-Tate.

"It's never too late to come out with a better product, and Borland stands a good chance of doing that," said David Perro, a software analyst at Dataquest, Inc. in San Jose, Calif.

Borland said it plans to ship a Microsoft OS/2 Standard Edition 1.0 version of Sprint in the third quarter for $299.95.

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Future of Quattro linked to Surpass

BY DOUGLAS BARNEY
CW STAFF

SCOTTS VALLEY, Calif. — Borland International now knows what the future of its Quattro integrated spreadsheet will be. It will stem at least in part from a spreadsheet package called Surpass that Borland acquired the rights to last week.

Like Quattro, Surpass, from Surpass Software Systems, Inc., has attempted to butt heads with the de facto standard, Lotus Development Corp.'s 1-2-3. Unlike 1-2-3, the innovative Surpass failed to take the market by storm.

But Borland said Surpass not only features good technology but it also resulted from a top-notch five-man development team, which was the real target of Borland's affection, according to Borland Chairman Philippe Kahn.

Head off 1-2-3 Release 3

Despite the acquisition of the Surpass technology, Borland has committed to an upgrade of Quattro within one year that will be based entirely on the current version of the product, a spokesman said. After that, Borland will begin to take advantage of some of the features of Surpass in an attempt to head off corporate users' migration to the still-unshipped 1-2-3 Release 3.

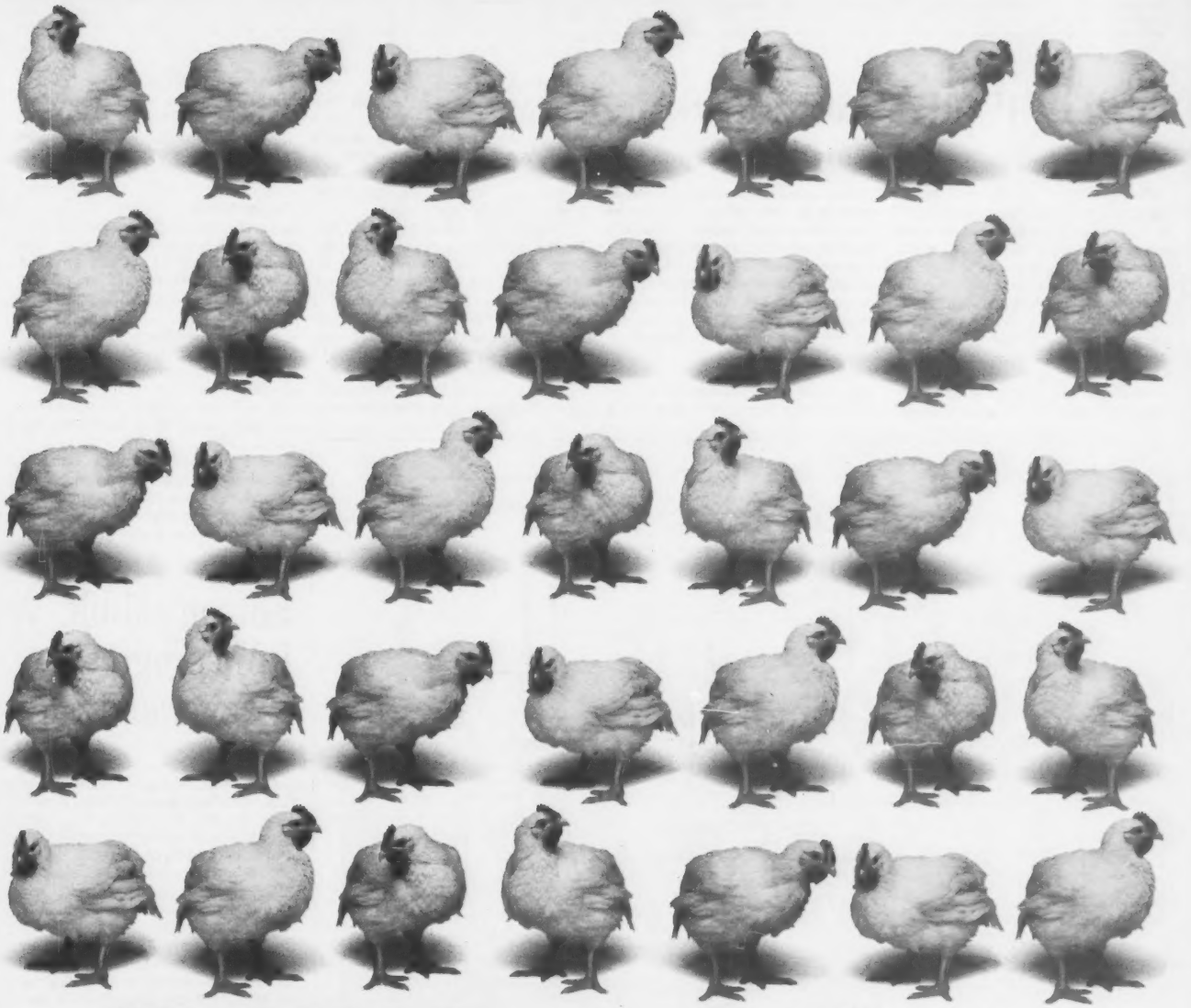
Chief among Release 3's attributes is file linking. "Microsoft Excel has file linking, Release 3 will have file linking and Quattro doesn't have it," a major software reseller explained.

The acquisition touched off a debate between the founders of the firms involved over the role Surpass will play in Quattro's evolution.

According to Surpass founder Seymour Rubinstein, Borland "can take certain features in Quattro and implement them in Surpass to the extent to which the customer base wants them."

Kahn, who calls those shots, dismissed Rubinstein's analysis. "He doesn't have much to do with this anymore," Kahn said. "He is not very technical."

Regardless of which software platform dominates Quattro's future, merging the two products may present some difficulty. Quattro was written in assembler and Surpass in Modula-2. That challenge will be tackled by the two firms' development teams, which will be merged to produce future versions of Quattro.



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As a result, programmer productivity at Holly Farms has reached an all-time high. "We've seen substantial improvement ratios," Clontz said. "In the time a programmer might turn out one CICS command-level program, he can turn out from six to eight programs on MANTIS."

Most of the 500-plus MANTIS applications now in production at Holly Farms are aimed at streamlining costs. For example, Data Processing used MANTIS to develop a model of how chickens consume feed over the course of their lives, allowing Holly Farms to cut production at one of its feed mills by 1½ days a week.

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Sterling buy-back fails

BY NELL MARGOLIS
CW STAFF

DALLAS — Sterling Software, Inc.'s recently proposed debt exchange and stock buy-back fell through late last month when debt-holders declined the offer, according to a company spokesman.

Under the recapitalization plan — announced several months ago, shortly after the IBM mainframe systems software vendor abandoned a proposed leveraged buy-out — Sterling offered to exchange an existing $106.5 million worth of 8% convertible subordinated debentures due in 2001 for straight debt at a higher rate: 11% notes due in 1998.

The company also offered to repurchase up to three million of its approximately six million common shares outstanding, at a price between $9 and $10.

Due to a restriction written into the current debt instruments, however, the transaction was conditioned on the holders of some $53 million worth of the 8% debentures accepting the invitation to exchange. They did not.

Sterling stock, which shot past 9 in anticipation of the recapitalization, declined after the offer expired May 27 to 6⅝ at the middle of last week.

Had it been consummated, said Sterling spokesman Ray Hannon, the scuttled plan would have conferred two benefits on the company: financial flexibility — prominently, the flexibility to deal in its own shares — and freedom from the debentures' convertibility feature.

"We want fewer shares outstanding," Hannon said. "That's clearly our long-term intent." Since January 1987, he said, Sterling, permitted by its bond-holders to buy up to $15 million worth of its own stock on the open market, has been making intermittent but steady purchases. The company reached the $15 million limit in late 1987.

This latest failed bid for increased financial flexibility and decreased exposure to the vicissitudes of the public market will be the company's last for the time being, according to Hannon.

"There isn't any follow-on plan," he said. "Literally, it's just back to business as usual."

On the block

In unrelated news, Sterling last week announced the impending sale of its commercial professional services group, a $34 million programming and systems design business with operations both in the U.S. and abroad.

The 350-employee U.S. division, headquartered in Atlanta, and the 125-employee overseas operation will be sold as discrete units to separate buyers, Hannon said. Neither the terms of the sales nor the identities of the buyers was disclosed.

In a prepared statement, company President Sterling L. Williams tagged the divestiture "a continuation of our strategy to focus our resources on the specific software where we see the greatest long-term potential."

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Korean 4M-bit RAM progress exaggerated

SEOUL, South Korea — An overambitious publicity campaign, designed to secure government funding, is being blamed for misperceptions regarding Korea's efforts to develop a 4M-bit dynamic random-access memory chip.

In February, Samsung Semiconductor & Telecommunications Co., which had been cooperating in a joint research effort sponsored by the Korea Semiconductor Research Consortium, was reported to have completed development of such a chip. However, according to Samsung, its 4M-bit DRAM chip is currently a trial version awaiting extensive testing.

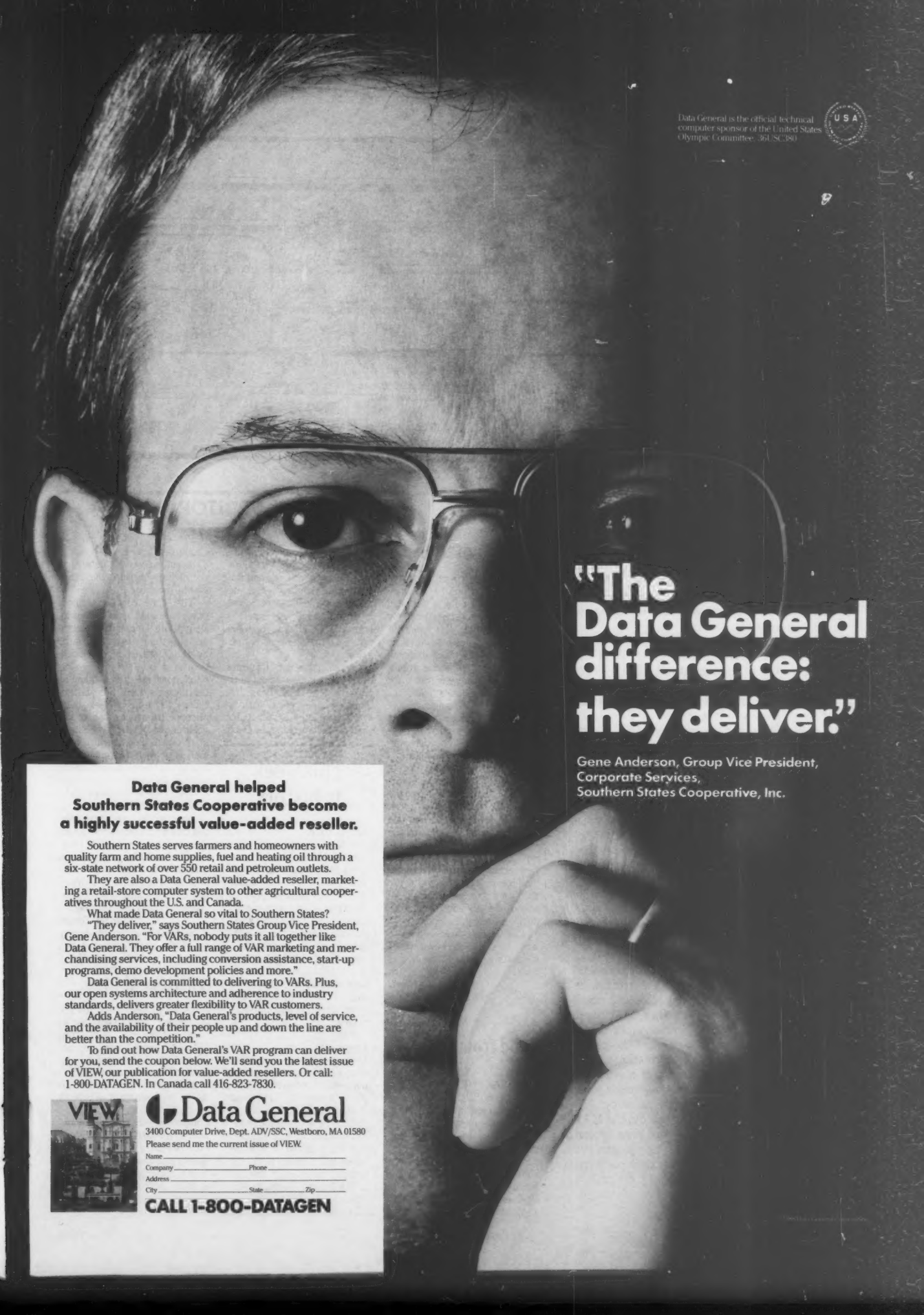
Other members of the joint research team, which has been disbanded, included a government-sponsored institute — the Electronics Telecommunications Research Institute — Goldstar Semiconductor and Hyundai Electronics.

The Korean government has earmarked $40 million for investment in the development effort, which was expected to result in a working product by March 1989. With the demise of the joint project, competition for the funds has heated up among the three companies.

The erroneous claims have prompted close scrutiny of the Korean firms by their U.S. and Japanese rivals, which are concerned that the Korean chip makers may be using proprietary technology fraudulently.

Hitachi Ltd. of Japan has filed a claim against Samsung alleging the latter firm is illegally using its patented DRAM manufacturing technology. Last year, Texas Instruments, Inc. collected $82 million in royalty fees from Samsung, which had illegally duplicated its processing technology for 64K- and 256K-byte dynamic RAM chips.

Several industry sources theorized that the Japanese firm is hoping to prevent Korean chip makers from capitalizing on the semiconductor trade disputes between Japan and the U.S.



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EDITORIAL

Worth the wait

IT'S BEEN A WHILE in coming, and when it arrives, it may fall slightly short of the lofty expectations laid before it.

But the funky new version of Manufacturing Automation Protocol, or MAP to a growing number of devotees, will be unveiled this week at the Enterprise Networking Event in Baltimore.

You just can't help but feel good about MAP 3.0 and the MAP effort in general. It's not necessarily that MAP 3.0 reaches new milestones in enterprisewide communications, which it does. Rather, MAP 3.0 represents the vanguard of a user-driven movement that, perhaps more than any other standards effort, has gotten the vendor community to bend to the will of its customers.

The rewards of this effort even before MAP 3.0 have been richly satisfying. Consider the case of Deere & Co. (see story page 43). The $4 billion manufacturing firm has parlayed a $2.5 million MAP cabling investment into a 50% reduction in its break-even point at its main manufacturing plant. A MAP and computer-integrated manufacturing combination also produced striking economies in other areas of production such as reduction of manpower and capital equipment requirements.

MAP 3.0 holds even greater promise. Enhancements to its presentation layer complete the protocol's compliance with all seven layers of Open Systems Interconnect's reference model. This will help users build applications that are increasingly hardware-independent.

Other elements of the enriched MAP 3.0 will provide faster response times and the ability to have higher throughput at the expense of some layers of the OSI model.

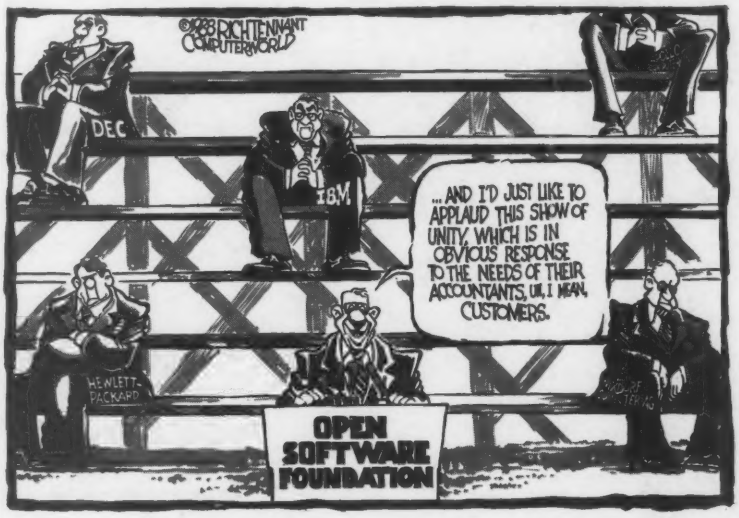
From the vendor community, MAP 3.0 will prompt generally higher performance products as well as quantum increases in data transmission speeds.

All this sounds even better when you realize that MAP was essentially founded as — and remains — a grass roots standards drive that, to this point, has resisted vendors that have attempted to position their products as de facto MAP standards.

Now an even larger battle looms for MAP enthusiasts — gaining the essential support from the upper echelons of management to extend MAP and its benefits in a truly enterprisewide fashion. This is a critical selling job, the success of which will determine whether MAP ever leaves the increasingly narrow confines of the factory floor and permeates the entire company.

Remember that the job of information professionals is to distribute the benefits of information technology throughout their organizations while masking the complexities of the technology.

Similarly, one good starting point in the MAP sell-job would be to mask — or, even better, eliminate — the sea of networking jargon and acronym alphabet soup from the sales pitch and stick to the basic fact: MAP saves.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LETTERS TO THE EDITOR

Open invitation

In Tom Umberg's letter to the editor [CW, April 11], he disagreed with me about the need for IBM DB2 source code. In my article [CW, Feb. 8], I used DB2 as an example of how software vendors are restricted in developing innovative and state-of-the-art software solutions for DB2 in categories such as fourth-generation language performance measurement, data base design and fast data retrieval because they do not have access to the DB2 source code.

Umberg was correct in that IBM has provided internal structures for DB2 data areas, and the company has followed strict naming conventions so that one can identify DB2 tables in the VSAM data sets. However, it is my contention that there are new techniques, such as artificial intelligence technology, where IBM's interfaces are woefully inadequate for building such DB2 complementary products.

I invite software vendors to write to *Computerworld* either supporting Umberg's position or mine.

Martin A. Goetz
Chief Executive Officer
Syllogy Corp.
Hackensack, N.J.

Good from the bad

The article "Vendors skewing DBMS tests" [CW, May 9] was an excellent first step in sorting out bogus benchmarks from true performance measurements.

However, a few points need clarification:

- Relational Technology, Inc.'s Silver Bullet benchmarks were based on the same stringent Debit/Credit specifications used by Tandem Computers, Inc. — not the TP1 test mentioned as used by mid-range software vendors.
- Tom Sawyer at Codd and Date Consulting Group was the auditor on Relational's tests. Sawyer is a well-respected expert in both the OLTP and relational data base management systems fields.
- Relational was not "just interested in the measurement of the performance of its software." As this was a joint effort with Sequent Computer Systems, Inc. to implement a full-scale Debit/Credit benchmark, not a subset TP1 test, we very definitely had the auditor measure the entire system overhead.

The Ingres cost per transaction per second as measured included both TP monitor and other subsystem costs as dictated by the Debit/Credit specification.

- Relational selected Sequent as the target system not just because its systems offer excellent price performance. One of the goals of our Debit/Credit benchmark was to demonstrate linear scalability — for example, that Ingres delivers proportionate value as the system is increased in size. This was confirmed by Codd and Date.

Benchmarks are a complex and therefore sometimes misunderstood measurement of hardware and software performance. Still, they have their place in the product profile as one of many factors to consider when choosing a relational DBMS package.

Aaron Zornes
Director of Strategic Marketing
Relational Technology, Inc.
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This week in history

June 5, 1978
Industry prognosticators bring IBM's rumored E computer series into focus. Power will range from about 100,000 to 1 million instructions per second, and the architecture will resemble a bus structure used in the recently announced Magnuson Systems Corp. M80 Models 3 and 4. IBM users will gain at least double the power of their current systems and even greater price/performance.

June 6, 1983
Data processing managers are poised for the reprogramming effort required to comply with the Tax Equity and Fiscal Responsibility Act of 1982. The act calls for financial institutions and corporations to withhold 10% of interest and dividend payments and pay those funds directly to the Internal Revenue Service.

A different tune

Hey William Zachmann, you got the wrong Bob Dylan line in "Toss out big iron" [CW, April 25]. Try again, man, maybe: "Something's happening and you don't know what it is . . ."

You missed the point. To

Continued on page 23

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

Out of the way, Dick Tracy

In a world of computer crime, sometimes the machines are the good guys

HARVEY NEWQUIST

Recent headlines make the computer industry look like it's riddled with crime. The computer itself is portrayed as an efficient replacement for the six-shooter in the hands of the modern-day Jesse James.

But computers can also be used to fight back — not just in tracking crimes but solving them. Expert systems and natural language interfaces are bringing better investigative techniques to police stations and federal agencies in the U.S.

The FBI will admit to but not discuss an expert system known as Big Floyd. This, the newest of the FBI's technological tools, will attack organized crime, particularly labor racketeering. Not to be outdone, the CIA also uses expert systems programming tools for a number of applications, especially personal computer-based programs.

Police in Baltimore developed an application to analyze routine household break-ins and burglaries. Typically, no one witnesses these crimes, and the police have only the clues left at the scene to work with. Baltimore's system required 200 hours of input from the department's veteran investigators regarding technique, gut feelings and hunches. The expert system covers everything from smashing windows to using lock picks on garage doors.

Farther west, the sheriff's department in Comanche County, Okla., uses Texas Instruments' Personal Consultant software to create AREST, the Armed Robbery Eidetic Suspect Typing system. This expert system application helps classify armed robbery suspects as possible or probable in a particular crime.

One of the most comprehensive projects any police department has undertaken to intelligently computerize its crime force occurred in King's County, Wash. The department, headquartered in Seattle, is hunting for the Green River Killer, a mass murderer believed to have killed as many as 46 women in the past five years.

The department's initial task in 1984 appeared insurmountable — sorting through 300,000 pieces of evidence and 2,000 suspects. Clearly some kind of computerized information system was going to be needed.

Judgment day

Investigators installed Judgment Space, or J-Space, from Information Access Systems, a Boulder, Colo.-based software developer. J-Space had been developed as an expert system and natural language tool for use on DEC VAX machines. J-Space's potential impressed police enough that they bought a VAX just for the investigation, despite being an IBM shop.

Most of the Seattle police department had never used computers. Thus, J-Space was designed to respond to natural language queries and associate different but related words.

The homicide investigation application went on-line in February 1985, using a VAX-11/750. The system has simplified storing and accessing an ever-growing mountain of information. More victims have been discovered in just the past few months, and the computerization is helping the Green River task force deal more efficiently with accumulating data.

Granted, tracking burglaries and serial murderers is not an everyday occurrence within corporate America's data processing environment. However, criminal investigation agencies face many of the problems encountered by traditional MIS departments.

Information Access is installing an MIS system for the Colorado Bureau of Investigation (CBI) called the Serious Offense Tracking System. As part of the National Law Enforcement Telecommunications System network, the bureau exchanges information on homicides, kidnappings, aggravated assaults and robberies, rapes and arson.

Via this network, each participating agency receives hundreds of reports per month from various national and regional crime information centers. Because of this huge flow of information in and out of CBI, processing delays have become standard procedure — nothing new to corporate America's DP centers.

Arson or robbery?

Since most information concerning serious offenses is time-critical, crime agencies are becoming bogged down. Information Access's system automatically classifies data from reports based on the offender's mode of operation.

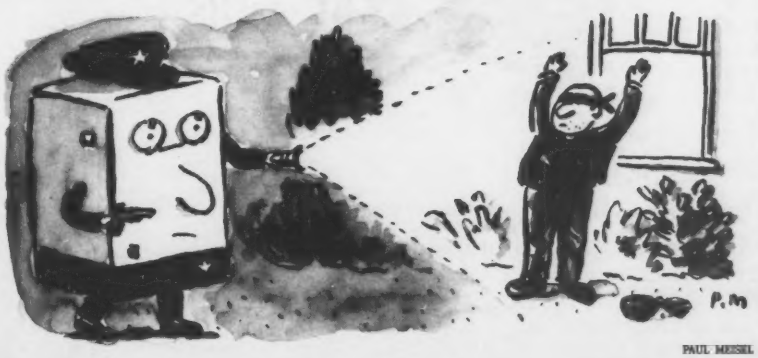
Once stored in this way, the Colorado bureau can retrieve information in the form requested. A conversational phrase can be used as a system query, thereby making full use of natural language capabilities.

The system then identifies and retrieves crime reports in order of similarity to the crime described by the requesting agency. Thus, the program makes a judgment about the type of crime or criminal and identifies those it finds similar.

Certainly, using fancy technology for law enforcement is something that Dick Tracy and his boys thought of many years ago. But it is the implementation of good hardware and advanced programming techniques that make that idea a reality.

As local and national agencies face larger MIS needs, a growing population and shrinking budgets and manpower, intelligent systems may prove to be better than anything Dick Tracy ever dreamed of.

Newquist writes and consults on artificial intelligence and other advanced high-technology topics from his office in Scottsdale, Ariz.



PAUL MEISEL

The time has come for IBM to deliver the goods

Customers are ready to return to the familiar

AMY WOHL

Is the tide turning? Has the pendulum swung back? Is the time right? Industry analysts may yet hold their tongues — and their opinions — waiting for more specific information. But the customers have begun to hum. It is nearly announcement time at IBM, and this time, the customers say, IBM has got the goods.

Remember, folks, the customers buy the goods. They have been miserly with IBM for a good long time, preferring to distribute their money among greater numbers of vendors.

They must have thought decentralizing meant buying from someone other than IBM. That isn't surprising, considering that IBM has been slower and more clumsy at offering appealing mid-range solutions.

Many customers have preferred to buy their departmental processors, scalable solutions and flexible LAN technology from somewhere other than the Big Blue Department Store. IBM solutions were viewed as fragmented, expensive and late.

The singles scene

A significant number of user organizations, particularly larger ones, are buying a lot of Personal System/2s, and quite a few are buying only PS/2s. Of course, many are buying PS/2 Model 30s, which are new personal computers only in terms of manufacturing data and not in terms of processor technology, speed, bus structure or capability.

Everyone is interested in multivendor solutions; that is, they want to be able to hook together many different brands of equipment into a single, transparently interoperable system. At the same time, much of the emphasis is on integrating what people already have rather than on encouraging or permitting the same flexibility of choice in future selections.

In fact, customers seem to be directing themselves toward a smaller, more controllable number of suppliers. But they are tired of acting as their own systems integrators in making such complex solutions happen. They are also frustrated by how much such solutions cost to implement and maintain.

Customers also point out how difficult it is to achieve reasonable levels of integration, with the goal being to send any kind of document in editable form from one workstation to any other workstation, regardless of vendor, software, architecture or location. Some customers are probably ready to swing the pendulum back toward single- or at least fewer-vendor solutions.

Comfort of the familiar

These frustrations are peaking at the same time a number of events are occurring: IBM's impending announcements of new PS/2 models and Silverlake. The PS/2 announcement will make the flavor and direction of IBM's commitments to PCs as workstations and the PS/2 as IBM's PC much more clear. In Silverlake, IBM's mid-range strategy comes to light at last, and this time, we suspect, the market may give it an enthusiastic reception.

> THE TIME seems ripe for rearranging, and some customers are deciding that in the complex dance routines of customer-vendor relations, changing partners one more time looks good.

What we are really seeing is the natural disillusionment that comes with growing familiarity — the familiarity of longtime IBM customers with other vendors of mid-range systems, especially DEC — coupled with new opportunities to return to the familiar, or IBM's product announcements.

The time seems ripe for rearranging, and some customers are deciding that in the complex dance routines of customer-vendor relations, changing partners one more time looks good.

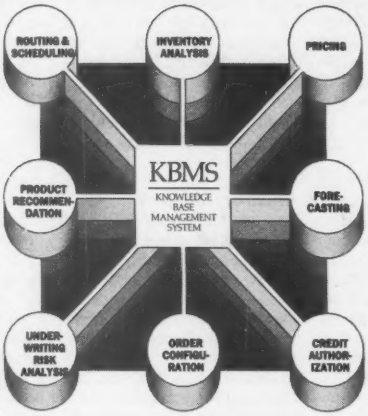
Silverlake speculations are everywhere. We could add our two cents, but the real point is not the architecture of the new machine or the intimate details of its operating system. The real issue is what the new platform offers and how it relates to IBM's and others' existing products.

When it debuts, Silverlake will look a lot like one more IBM product with one more operating

Continued on page 23

Wohl is president of Wohl Associates in Bala Cynwyd, Pa., and editor of "The Wohl Report on End-User Computing" newsletter.

How KBMS solves a new class of applications.



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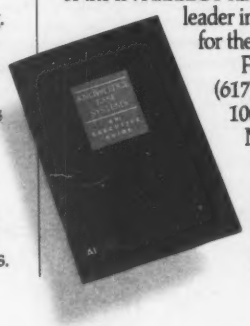

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Different

FROM PAGE 20

start with, the million instructions per second (MIPS) issue is a red herring. The MIPS might look cheaper on the IBM Personal Computer, but can you begin to utilize them when most of the computer's time — as the computer sees it — is spent waiting for some user response? And since OS/2 is a single-user multitasking operating system, that situation is not about to change. The only time your PC is really busy is when it is trying very hard to be a television — for example, processing graphics — which all too often is when it is trying to compensate for its user's poor literacy skills and lack of analytic ability.

But the real issue here — the one that made Zachmann want to trash those mainframes — is something else entirely. It is an issue of control, of who calls the shots: the individual — the PC user — or an insensitive bureaucracy — MIS management.

Right now, the individualists may be programming in C on PCs, but there is no magic in the language or the box. Once PC-based systems start taking over the functions of today's mainframes, management will impose the same stultifying middle management-dominated control structures on those systems.

The real issue is that the hierarchical model of corporate management that evolved to control mass production is inadequate for managing intellect-intensive enterprises like software development. This is amply illustrated in the PC world as small, innovation-driven companies run by programmers that used to produce masterpieces are acquired by businessmen who turn them into large marketing-driven companies run by executives who produce vaporware.

Janet Ruhl
Ruhl Computer Services
Windsor, Conn.

IBM goods

FROM PAGE 21

system and one more architecture. It probably will not look like one more interface, because we expect it to be Systems Application Architecture-compliant.

But that picture could be deceiving. Silverlake is the follow-on for an entire family of products (System/36 and 38, of course, but also the long-forgotten System/32 and 34). Therefore, it is likely to be broader in size and higher in price than the usual IBM product line.

> HINTS ABOUT properly positioning Silverlake seem unusually thorough, even for IBM

Benefits abound

IBM's mid-range, then, could start to look like a broadly scalable environment with a single operating system that is able to run an entire large population of software across a broad line of hardware.

Add in the fact that IBM clearly intends to facilitate porting System/36 and 38 software to the new processor family. This potential capability would give Silverlake an immediate software population and deftly avoid the usual new system start-up problem of, "Nice hardware, let me know when the software comes."

Hints about properly positioning Silverlake seem unusually thorough, even for IBM: Customers seem well briefed, and developers nod knowingly whenever anyone mentions Silverlake.

What happens now? IBM makes its announcement and we see what the real product and the actual delivery dates look like. Early customer reaction will range from the cautious — "We consider all appropriate new IBM products" — to the cynical — "That's a scalable operating system?" — to the enthusiastic — "We're pinning our new strategy on it."

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SOFT TALK

Howard Fosdick

DB2 users can be choosy

On-line DB2 programs can be written in four ways: with CICS, IMS/DC, TSO/ISPF or the DB2 Call Attach Facility. One or more of these monitors may attach to DB2 concurrently; DB2 handles data integrity, regardless.

This leaves programmers with a choice they did not face in the world of third-generation data base environments like IMS/DB or DC and CICS/VSAM. For the first time, developers may choose for which teleprocessing environment to write their applications. Statistics from the Midwest DB2 User Group show that more than 90% of IBM DB2 sites install one of the transaction monitors (CICS and IMS/DC) and TSO/ISPF. How do developers judge which on-line environment is most appropriate?

First, let's discuss the Call Attach Facility. This approach is significantly different from the others — it is rarely used by MIS shops. Call Attach provides a low-level connection to DB2 through a small group of commands. Programs must monitor their DB2 connection themselves, but this level of detail and

Continued on page 27

Curing backup blues

Comdisco, Sungard open electronic vaults to banks

BY ALAN ALPER
CW STAFF

NEW YORK — Electronic vaulting — the transmission of backup data for an executing application — is about to be ushered into existence in New York's competitive banking environment.

Comdisco Disaster Recovery Services, Inc. and Sungard Recovery Services, Inc. have both disclosed plans to offer competing 24-hour, seven-day-a-week vaulting services.

In the event of a disaster, the electronic vaulting service is expected to expedite the entire data recovery process. Vaulting eliminates the need to physically transport backup tapes from a customer's data center to a remote facility, which is usually hours away, and then to a recovery center.

"Electronic vaulting overcomes the logistical problem of having a number of [backup tape] pickups each day," said Jim Bigham, a vice-president at Prudential-Bache Securities, Inc. "This way, at the point a system finishes up, you can send the data to the off-site vault. It reduces your exposure and enables you to restore faster."

The services are expected to initially appeal to financial institutions that process high volumes of on-line transactions each day of the workweek. Those companies are particularly vulnerable if a disaster strikes during the day, said Rick Wargo, Comdisco's vice-president of product development.

Comdisco's approach is software-intensive and involves di-

Continued on page 27

DEC utilities allow Cray programming on VAX

BY NELL MARGOLIS
CW STAFF

MAYNARD, Mass. — A recently introduced set of software tools and services from Digital Equipment Corp. allows programmers to develop Cray Research, Inc.-specific code on a VAX, according to a DEC spokeswoman.

The VAX SDE/Science Integration Package, which debuted in Boston last month at the Second World Supercomputer Exhibition, offers scientific researchers working with computationally intensive applications — the kind that mandate supercomputing clout — the chance to save application development time.

DEC is targeting the new software package at researchers involved in fields such as molecular modeling, high-energy physics, computer simulation and computational fluid dynamics. Such researchers are often found in industrial sectors such as government, aerospace, education and petroleum.

The VAX SDE/Science Integration Package includes templates, or programming guidelines, that let VAX-based users write code in Cray Fortran 77,

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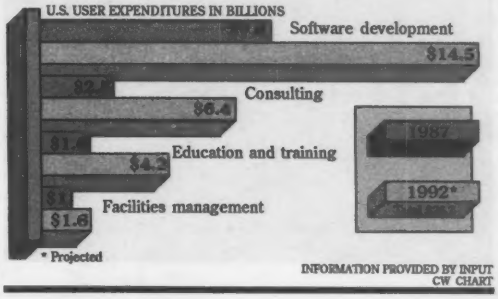
Inside

- Oracle eases complexities of report writing. Page 26.
- ADR promises Cobol users swift development. Page 26.
- CDC's latest NOS/VE lets users cluster up to eight Cyber mainframes. Page 29.

Contract services growing 16% annually

With limited internal skills and increasing application backlogs, many organizations are turning to outside services



BMC puts DB2 tool out to test

BY JEAN S. BOZMAN
CW STAFF

HOUSTON — BMC Software, Inc. in Sugar Land, Texas, is conducting four-month beta tests of a new utility that it claims will manage disk drive use for sites using IBM's DB2 relational data base.

Called the DB2 DASD Manager, the $20,000 system is slated to be generally available in the fall.

The software package automates critical DB2 management functions, such as the labeling of direct-access storage device volumes for DB2 table spaces. It also collects data on DB2 transactions, allowing users to determine whether their DB2 system is functioning efficiently, company spokesmen said.

The DASD Manager estimates disk space requirements, allocates VSAM files, enforces DB2 naming conventions and automatically generates job streams for DB2 utilities.

"We let the user define which

Continued on page 28

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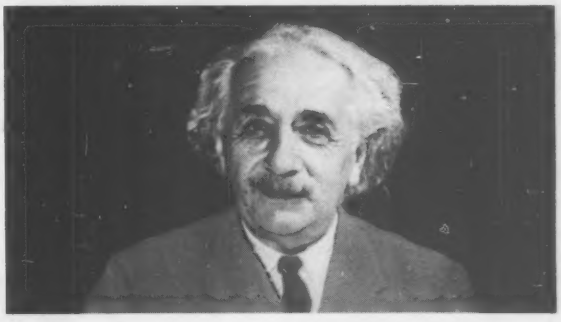

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Oracle report writer bypasses programming

BY NELL MARGOLIS
CW STAFF

BELMONT, Calif. — Oracle Corp. is currently offering a report writer that lets users quickly create complex reports from information stored in relational data bases without resorting to any programming, according to the company.

The SQLstar Reportwriter builds reports from data base objects, leveraging off the advantages of SQL constructs to ease and speed data manipulation, according to Oracle's director of new products, Larry Stevens.

Meanwhile, he said, a nonprocedural visual interface shields users from the complexities of the software's function.

The result, Stevens said, is a software package that delivers the likes of multicolumn labels and form letters, cross-tabulation/matrix reports and multisection reports that present data from more than one SQL query with a sizable savings in development time.

Helper

Prominent among the features that distinguish the new reporter is Hyperhelp, a context-sensitive Help facility that lets users access a Help screen by identifying a puzzling word or phrase with the cursor. Each successive layer of help needed can also be reached with a keystroke. Hyperhelp, which debuts with SQLstar Reportwriter, will become a standard Oracle feature, according to Stevens.

In addition, SQLstar Reportwriter offers a series of built-in functions to aid the user in a series of calculations, such as rank, total, running percent of total and average. A special layout feature offers the possibility of integrating the results of multiple queries into a single report, and a forward-reference facility provides advance totals and other often-delayed information throughout the report.

When coupled with the SQLstar Connect component of Oracle's SQLstar distributed data base management system, SQLstar Reportwriter users can reach beyond Oracle into other SQL-standard data bases, an Oracle spokesman said.

The report writer need not reside on the same system as the data bases to be used, the vendor said. Through Oracle's networking product, SQLstar Net, users can access data bases across systems connected via communications protocols, including IBM's Systems Network Architecture, Digital Equipment Corp.'s Decnet and Transmission Control Protocol/Internet Protocol.

The SQLstar Reportwriter is available on DEC VAX/VMS and Sun Microsystems, Inc. workstations. Prices range from $200 to $64,000.

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ADR revamps Cobol aids

PRINCETON, N.J. — Two releases from Applied Data Research, Inc. (ADR) promise Cobol users a swifter, surer trip through the application development and maintenance life cycle.

For Metacobol Release 10.0, ADR revamped the architecture of its batch Cobol preprocessor to reduce execution time by as much as 50%, according to the company.

While enhanced macroprocessing capabilities, virtual storage usage and addressing techniques speed execution, newly expanded 16M-byte internal tables allow users increased developmental flexibility, according to a company spokesman.

Eases code conversion

Metacobol Release 10.0, the spokesman said, handles code conversions between Cobol dialects with greater facilities than formerly, and it includes strengthened quality assurance aids and structured program development capabilities.

In addition, the latest Metacobol fully supports ANSI Cobol 85 as implemented in IBM's VS Cobol II, according to ADR.

Such support includes recognition and expansion of nested copy procedures as well as all VS Cobol II-specific syntax forms, including new language elements, extended data item sizes and new key words.

Continued support

Also newly available, Release 3.1 of ADR/DL, the company's interactive Cobol application development and maintenance system, continues the already-seeded integration with ADR's Datadictionary product with the implementation of 30-character name support as well as test-status data-view support.

In addition, reliance on Datadictionary facilities yields 30% to 80% improvements in precompile time, according to an ADR spokesman. Such enhancements increase ADR/DL's data manipulation language support for the company's Datacom/DB data base management system, the company claimed.

Permanent license prices for Metacobol range from $9,700 to $12,800; ADR/DL permanent license prices range from $23,500 to $31,500. Six-, three- and five-year leases are available.

DEC

CONTINUED FROM PAGE 25

Cray Fortran 1.15 and Cray C to be compiled on a Cray supercomputer, the spokeswoman said.

The DEC software also includes interfaces to Cray compilers as well as to Cray communications software and a number of third-party scientific subroutine libraries already popular among scientific users. Thus equipped, developers can skip several steps in writing, editing, compiling and debugging Cray applications, the spokeswoman said.

In addition, DEC has expanded two VAX tools to coordinate with the new software package in working with Cray languages. The VAX Language Sensitive Editor now contains templates to help users get Cray syntax correct and transfer Cray code to the supercomputer for compilation in a single step without mastering the Cray.

The editor also makes templates and Help screens available to the user.

The DEC/VAX Module Management System streamlines the maintenance of Cray applications by simplifying management of module changes and relationships, the spokeswoman said.

VAX SDE/Science Integration Package, which requires a Decnet connection to a Cray system as well as the appropriate Cray software, is slated to be available in the first quarter of fiscal 1989 at a license price of $15,503.

Fosdick

CONTINUED FROM PAGE 25

control may be desirable in certain circumstances.

For example, concurrent attachment to more than a single DB2 subsystem is possible. Application developers usually prefer the wide range of application services supplied by monitors such as IBM's TSO/ISPF, CICS and IMS/DC to the Call Attach Facility.

The TSO/ISPF environment offers higher programmer productivity, greater ease of use and greater flexibility than either the Call Attach Facility or the transactional monitors. As the "dialogue manager" of IBM's Systems Application Architecture, ISPF also provides various cross-systems advantages.

These include transferability of programmer and end-user skills, a consistent user interface and a high degree of code transportability. ISPF's companion product, ISPF/PDF, extends these cross-system advantages to the programmer's development environment.

More interesting than these general characteristics, however, are the benefits of TSO/ISPF that are specific to DB2 programming. A whole new kind of programming is evolving, distinguished from the transactional applications traditionally written by MIS departments. These new applications offer very high function per logical transaction and

Continued on page 28

Curing

CONTINUED FROM PAGE 25

rect communications under IBM's Systems Network Architecture and VTAM between a customer's mainframe and a dedicated host at the firm's hot site in Carlstadt, N.J.

Data is transmitted at speeds ranging from 9.6K bit/sec. on T1 lines to 6M bit/sec. over T3 fiber-optic lines and is stored on IBM 3480 cartridge tapes. The company is remarketing System Center, Inc.'s Network Datamover bulk-transfer software, which allows users to transmit data either in batch or interactive modes or by designated times of the day.

Comdisco will also offer remote transaction-logging software developed by E-Net Corp., which provides journaling capabilities. E-Net, in which Comdisco has acquired a one-third interest, is also developing software to provide data base shadowing capabilities, Comdisco said. The company is also remarketing NTX Communications Corp.'s 3800 communications processor to provide channel speed communications.

Comdisco prices range from $2,500 to $20,000 per month and include one shift of use and all the technical support required to store backup data on IBM 3480 tape cartridges. The company is conducting beta tests at its Chicago data center and at a New York bank, believed to be Manufacturers Hanover Trust Co. An early support program will begin this month with six customers, Wargo said.

Comdisco is establishing a separate subsidiary to operate its vaulting service, Comdisco Computing Services Corp., which will be located at its Carlstadt recovery site. To form the subsidiary, the company is acquiring the majority of the assets of Manufacturers Hanover Data Services Corp., a unit of Manufacturers Hanover Trust.

Sunvalt security

Sungard's service, called Sunvalt, is based on a channel extension approach using Data Switch Corp. high-speed data switches, both at the customer's data center and at Sungard's Philadelphia hot site.

To maintain a high level of security, each customer will receive a dedicated vault within the hot site with a capacity to store 15,000 IBM 3480 cartridge tapes. Each vault is walled off and can only be accessed by card keys, Sungard said.

Pricing on the Sunvalt service, which is set to be launched at the end of the month, will range from $3,500 to $15,000 per month.

Fosdick

CONTINUED FROM PAGE 27

promise great value to the business enterprise. However, these programs also have a high cost in terms of CPU and I/O requirements.

This new kind of programming might be called interactive or conversational programming. It represents the combination of the TSO environment, the relational data base management and the ISPF application extensions to the TSO monitor.

A TSO/ISPF DB2 application requires compatibility with older TSO-based applications. It also requires integration with several language options for DB2 programming, as well as end-user access to data through ad hoc queries. This last need is met through tools like IBM's QMF and DBEDIT or through DB/PRO-EDIT, from Updata Software in Holmdel, N.J.

All these tools are accessible through the TSO/ISPF interface. TSO/ISPF is the preferred monitor for this application because it provides the flexibility, end-user access and compatibility desired.

The CICS and IMS/DC monitors support the traditional, transactional programming required in so many MIS applications. These transactional monitors optimize the use of computer resources and result in more efficient systems than does TSO/ISPF.

For example, transactional teleprocessing networks often support several thousand on-line concurrent users, whereas equivalent hardware can only support a couple hundred TSO/ISPF DB2 users.

Transaction-based applications — requiring best response time, supporting a large number of users, handling multiple concurrent updates and needing transaction management facilities — are good applications for CICS or IMS/DC environments.

The bottom line is that there are valid reasons for the use of the DB2 Call Attach Facility, the TSO/ISPF environment and the CICS and IMS/DC monitors for DB2 on-line programming.

Application developers now face a choice of teleprocessing monitors for on-line DB2 programming. Developers should not merely implement under the system of their past experience. For best use of DB2, programmers must recognize the characteristics of the different on-line environments. Users face a richer range of options and must intelligently choose among them.

Fosdick is president of the Midwest DB2 Users Group and has written *Using IBM's ISPF Dialog Manager* and *VM/CMS Handbook*.

BMC

FROM PAGE 25

DB2 utilities he wants to run and against which applications they should run," said Jack Olson, a senior developer at BMC. "Then, we generate all of the job commands through our program."

The DASD Manager allows users to restart a DB2 application, giving DB2 data base administrators greater control, Olson said.

Freedom

"Right now, you have data base administrators spending much of their time writing miles and miles of JCL code," Olson explained. "We are trying to free them from the most repetitive parts of their job."

Olson demonstrated the DASD Manager at a recent BMC conference, showing how the product can cut set-up time from several hours down to several minutes.

The DASD Manager may ease the migration of data from one DB2 system to another, Olson said.

He said the DASD Manager's import function will take in the existing object definitions from the first DB2 system and then allow users to edit the object definitions.

Finally, the DASD Manager will build and execute a work list that will create objects in the new DB2 system, according to company claims.

SQL Performance for OLTP.

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NEW PRODUCTS

Systems software

Control Data Corp. has introduced a version of its NOS/VE Cyber operating system, which allows users to cluster up to eight CDC Cyber mainframes for transparent file sharing, according to the vendor.

NOS/VE Version 1.3.1 is also said to include improved validation and resource management capabilities, job scheduling enhancements and greater disk fault tolerance. Software application development capabilities have also been enhanced.

NOS/VE Version 1.3.1 costs from $15,994 to $278,198, depending on Cyber mainframe size.

CDC, 8100 34th Ave. S., Minneapolis, Minn. 55420. 612-853-6137.

Applications packages

Symbolics, Inc. has announced **Statice**, an object-oriented data base system for its line of symbolic processing systems.

The product is said to provide permanence, sharing and consistency of objects within the processor's programming system. The system was designed to ensure accurate and orderly maintenance of data objects, including those utilized by multiple users.

Statice costs $10,000 per site license.

Symbolics, 11 Cambridge Center, Cambridge, Mass. 02142. 617-621-7500.

Languages

Applied Dynamics International has announced the availability of Fortran for use on the company's scientific computer, the System 100.

Called **Fortran/AD**, the product can reportedly be used to run both real-time and non-real-time continuous system simulations. The software is targeted at general engineering applications, including those that are computationally intensive, involve high numerical precision and need to access large function generation tables in an on-line environment.

Fortran/AD costs $15,000.

Applied Dynamics, 3800 Stone School Road, Ann Arbor, Mich. 48108. 313-973-1300.

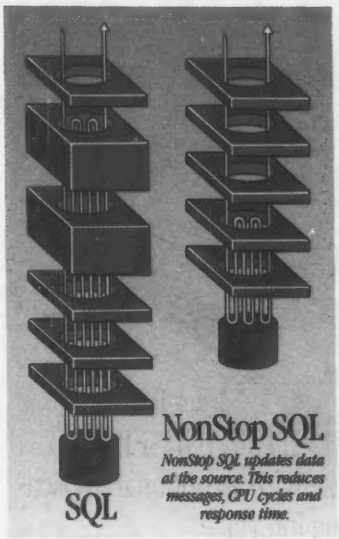
Utilities

Software Translation Corp. has repriced **Cequal**, its Fortran-to-C converter utility.

Now offered at $495, the product reportedly translates 100% of Digital Equipment Corp. VAX Fortran and its extensions to ANSI C with a set of I/O and mathematical runtime libraries that emulate Fortran functions on the DEC VMS operating system.

A demonstration version of Cequal costs $75, which the vendor said will applied toward the future purchase of the Cequal utility.

Software Translations, 1223 Peoples Ave., Troy, N.Y. 12180. 518-271-1222.



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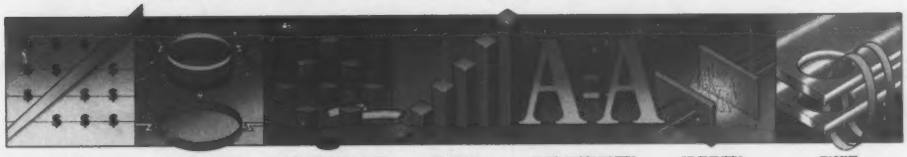

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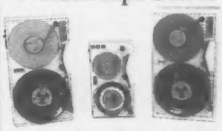

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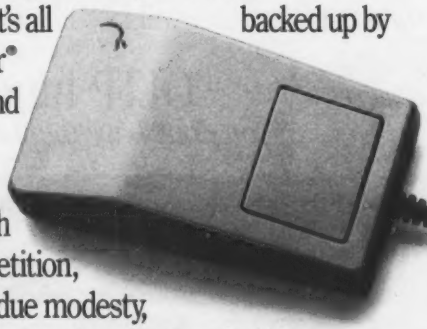

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   32. Programmer, Methods Analyst
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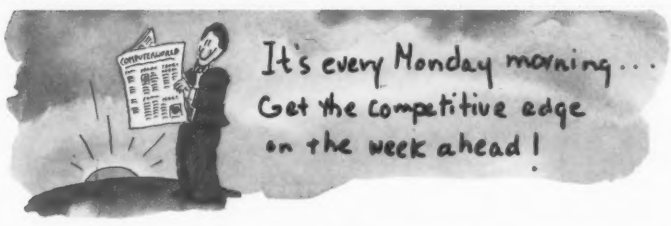

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MICRO BITS

Douglas Barney

IBM tunes in Micro Channel

The big bad Micro Channel. Many users and IBM competitors have wondered just what is so great about IBM's Micro Channel architecture. In fact, many skipped the wondering part and jumped right into the lambasting stage. It has been extraordinarily easy to criticize the Micro Channel, because its benefits have so far been elusive. There are simply no boards yet that take specific advantage of it.

A recent conversation with an IBMer shone some light on this still-controversal subject. According to Dick Kamerer, users can do things with a Micro Channel that are just impossible with the older IBM Personal Computer and PC AT buses. Kamerer, who serves as senior planner on IBM's OS/2 Extended Edition, should know.

This gets a mite technical, so close your eyes and go with it. You can run two asynchronous sessions on a PC bus, but eight on the Micro Channel. You can run only one IBM Synchronous Data Link Control (SDLC) session on a PC bus, but two on a Micro Channel. You cannot mix and match asynchronous com-

Continued on page 38

New-wave engine gearing up

Multics architect approaches relational with an unconventional twist

BY DOUGLAS BARNEY
CW STAFF

SANTA MONICA, Calif. — Later this year, the first in what may be a torrent of products based on a radically new data base engine technology from Nucleus International Corp. will ship.

The vision for the technology is attributable to Edward L. Glaser, a computer architect who wrote the original Multics operating system for Honeywell Bull, Inc. mainframes. For his complex development work, Glaser, who is blind, uses an elaborate speech synthesis system that dictates the code.

Lockheed Corp. was so impressed with Glaser's ideas that it kicked in approximately $8 million to get the product to market. Lockheed may use the software on chips for military applications, such as a fighter plane data acquisition and analysis system, according to Derek McLeish, president of Nucleus.

The engine will inevitably butt heads with a variety of players, including IBM, Sybase, Inc., Lotus Development Corp. and Oracle Corp.

All of these vendors use somewhat conventional approaches to building engines and are largely differentiated by performance, the particular dialect of their SQL, front-end tools and networking support. So far, however, only Oracle is delivering a micro-based data base engine.

With most engines still in development, it could be anybody's ballgame. "We are a dark horse in this whole relational engine race," McLeish said. The Nucleus product has been in development since 1983.

The SQL-based software departs from conventional SQL systems, which store data in rows and columns, often storing the same piece of data many times.

Nucleus has a different approach. It stores data as vectors or pointers to domains of data. As a result, the data values appear in just one location.

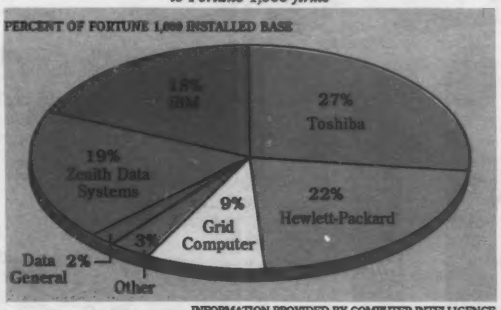
This approach offers several benefits, Nucleus officials and observers claimed. The system

Continued on page 38

Data View

Toshiba tops laptops

The Japanese manufacturer is the biggest supplier of laptop machines to Fortune 1,000 firms



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Progress adds SQL support

BY ED SCANNELL
CW STAFF

BEDFORD, Mass. — Progress Software Corp. recently said it plans to incorporate support for SQL within the upcoming release of its fourth-generation language and data base management system this fall.

The company said it has structured the product to accept SQL and Progress statements in the same procedure. Developers can use pure SQL syntax, regu-

Continued on page 36

Framework reborn as net package

TORRANCE, Calif. — After almost 2½ years, Ashton-Tate Corp. has followed up Framework II with a version that includes electronic mail capabilities and support for networking and full-color screens.

Ashton-Tate has admitted to repositioning the program from its first release as a panacea to a decision support package. Changes were based on customer feedback.

In addition to touting decision support, Ashton-Tate is pushing Framework III as a network package. The network version supports up to five users, comes bundled with E-mail and offers file locking and printer sharing.

Improvements made to the word processing module include more complete text formatting, editing and printing features, such as multiple-column capability and newspaper-style text layouts.

The single-user version costs $695 and is slated to be available in July. Framework III LAN costs $995 and is scheduled to be shipped in October.

Inside

- Dbase creator Ratliff tries repeat performance. Page 35.
- Hypercard simplified. Page 36.
- Zenith releases two 80286 PCs. Page 40.

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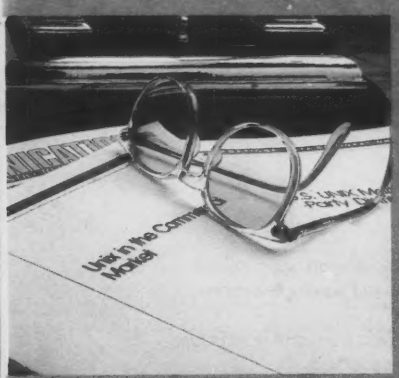

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CORPORATE SOFTWARE

SMALL TALK

Rich Finkelstein

Beauty's but skin-deep

Not too long ago, some friends of mine purchased a house built on filled land. The house was dazzling, and they were sure their investment and future were secured.

Unfortunately, within a couple of years the house began to sink. They had forgotten to check the foundation.

When planning our future, we often get so mesmerized by superficial beauty that we forget about foundation. In this period of major transition in microcomputing, ignoring the basics can lead to similar trouble.

Data base servers and SQL will certainly play a role in most organizations' futures, but they only take care of back-end requirements. What about connectivity to front-end user applications?

To address this need, Lotus has announced Blueprint, a written specification and tool kit that allows any data base management system vendors to plug into Lotus's 1-2-3 family of software. Simply put, Blueprint permits end users and application developers to mix and match Lotus front-end tools with back-end DBMSs in the manner that best suits their needs. In Lotus's initial announcement, the firm promised Blueprint support for its entire family of 1-2-3 products, including 1-2-3 Release 3.0, 1-2-3/G, 1-2-3/M

Continued on page 36

Dbase creator Ratliff in hot pursuit of repeat stellar performance

IN PERSON

Data base management systems are in Wayne Ratliff's blood. As the creator of Ashton-Tate Corp.'s industry-standard Dbase program, Ratliff has earned himself at least a footnote in the annals of personal computer software history. Today, Ratliff is trying to repeat the stellar performance of Dbase with a new DBMS developed by his company, La Crescenta, Calif.-based Ratliff Software Productions, Inc.

Teamed with the marketing muscle of Migent Software, Inc., Ratliff is ready to make a run at his old employer and other software big leaguers. But the product, called Emerald Bay, was hit with problems even before its delayed release in March. Not only did Ashton-Tate try to stop its development with charges of trade-secret violations, but the product has yet to offer what many consider an all-important SQL implementation.

Ratliff *is underwhelmed by Ashton-Tate's Dbase program*

Ratliff discussed Emerald Bay, his former employer and the DBMS market with *Computerworld* West Coast correspondent Stephen Jones.

How do you think Ashton-Tate has treated your baby, Dbase, since you left the company in 1986?

They've developed it rather slowly, but that's part of the reason I left Ashton-Tate. I'm not particularly pleased with how they've handled it. They paid too much attention early on to the Framework-like user interface, and I think they didn't pay much attention to the fundamental base technology.

Did your legal battle with Ashton-Tate have any effect on the development of Emerald Bay — either in delays or the content of the product?

The process of dealing with lawyers during that time delayed my development by about three months, and it chewed up a considerable amount of other members of the development team's and Migent's time. I can't talk about the content of the product, other than that Emerald Bay is the product I always wanted it to be. I don't feel that it's been crippled in any way.

Some have said the first version of Emerald Bay is lacking a lot of the features needed to make it truly relational. Is this true?

I don't think that's true at all. Relational is a difficult concept that doesn't really make much of a difference to real people. Emerald Bay can be relational, but it is not constrained to be only relational. It depends on the surface; when we put an SQL surface on top of it, it's going to have the appearance of being extremely relational. The engine itself is not dictating that it has to be purely relational. In fact, the engine does not natively perform a lot of the functions that are associated with a relational data base. It does, however, provide all the functionality required for a relational-type surface to do rela-

Continued on page 38

MIS Adventists handling growth, foreign currencies

BY ALAN J. RYAN
CW STAFF

WASHINGTON, D.C. — With organizations located in 190 countries, the MIS leaders of the Seventh-day Adventist Church have more to contend with than religion.

As in any business, the MIS department is concerned with such critical issues as support, training and hardware and software compatibility. For their diverse user base, the Adventists had to find an accounting package on which they could standardize. The nature of the business required that the package allow users to work in their native languages; it also required the ability to handle currency conversions.

"Our treasurers developed an internal accounting manual to standardize the accounting systems that would be used in all of our organizations all over the world," said Michael Haney, the church's associate director of MIS. "MIS was charged to im-

Continued on page 38

Top sellers

Software: May 23-27

1	Lotus's 1-2-3
2	1-2-3 bundled with Goldata's Save Our Spreadsheet
3	Wordperfect Corp.'s Wordperfect
4	Fifth Generation Systems' Fastback Plus
5	Lotus's Value Pack
6	Ashton-Tate's Multimate Advantage II
7	Software Publishing's Professional Write
8	IBM's Fixed Disk Organizer
9	Ashton-Tate's Dbase III Plus
10	Software Publishing's Harvard Graphics

INFORMATION PROVIDED BY CORPORATE SOFTWARE, INC.
CW CHART

SOFT TIPS

Sorting made simple

You can do three-key sorts in Lotus Development Corp.'s 1-2-3 using a double-sort method. First, decide which are your first, second and third columns for the sort. Select the second column as the primary sort key and the third as the secondary sort key.

Next, create a new column and use the /DATA FILL command to fill it with numbers, beginning with 1 and going to the bottom of the column. This column can be anywhere within the column you are sorting.

Finally, sort again, using the first column as the primary sort key and the number column as the secondary key. You must expand the sort range to include the column of numbers you have created. When you are finished sorting, you can simply erase or delete the column of numbers you created.

Information provided by Corporate Software, Inc., a Westwood, Mass.-based software reseller.

D fosters ABCs of relational DBMS

BY JAMES A. MARTIN
CW STAFF

DALLAS — Mainframe data base capabilities on a microcomputer? Users of Caltex Software, Inc.'s D the Data Language said recently that the package running on a personal computer comes as close as any data base package to offering the power and flexibility of a host-based data base application on a micro.

According to Caltex, D is a relational data base management system and application development tool; a fourth-generation language that enables users to more flexibly create reports. The product was under development for more than two years and is just now being actively marketed.

D the Data Language

Price: $395

- Supports IBM PC, PC XT, AT and compatibles
- Requires 512K bytes memory, DOS 2.0, 20M-byte hard disk drive

The goal of D is, in the words of the company, to "put the thinnest layer possible between the user and the data," while providing a fully integrated environment for managers, developers, programmers and any end user in need of manipulating data for reports.

With a few exceptions, D has accomplished all of the above, users reported.

"It's an easy language to learn; you can start working with it almost immediately," said Chip Keen, owner of Hansville Repair, an automobile repair shop in Hansville, Wash. "But to really get it to do what you want, it takes several months of working with it. The more you think about it, the more you realize what the program can do, so the temptation leads you into more complicated and powerful procedures."

Keen switched to D after de-

Continued on page 38

Tool kits simplify Hypercard use

BY JULIE PITTA
CW STAFF

HUNTINGTON, Conn. — Softworks, Inc. has introduced two tool kits for Hypercard, the personal data base manager for Apple Computer, Inc.'s Macintosh.

Called Hypertools 1 and 2, the products were designed to simplify the use of Hypercard, which is currently bundled with every new Mac purchased. Hypertools 1 is a set of utilities aimed at developers of Hypercard "stacks."

Hypertools 2 is a set of utilities targeted at Macintosh users and Hypercard stack developers, extending Hypercard's display and data entry functionality.

Both products were designed to be integrated into user-created and commercially developed stacks.

Hypercard, which allows Mac users to integrate text, graphics and video to create personalized data bases, is made up of three disks and a backup. Each disk, in turn, is made up of a number of stacks.

Apple officials have said the product is based on an index card concept. Users store information on "cards" as they would jot notes on an index card. The software allows users to organize information by linking cards, which are then organized into stacks.

Although Apple officials had hoped Hypercard would create a new third-party industry around stack development, such a market has been slow to develop. Industry observers have said that users have not taken advantage of Hypercard's capabilities because it is either too time consuming or too complex for the average Macintosh user.

Compounding the problem has been the shortage of memory components. For optimal use, Hypercard requires at least 2M bytes of random-access memory. Because of the scarcity of dynamic RAM chips, few Macintoshes are being shipped with more than 1M byte of RAM.

According to officials, Hypertools was designed to solve one of those problems — the complexity of using and developing stacks for Hypercard. Hypertools 1 features 12 tools for designing and using Hypercard stacks, including an icon editor, allowing users to create and modify icons directly in Hypercard using its painting facilities; and information tools for displaying, printing and exporting cross-reference listings.

Hypertools 2 allows users to add features to a stack without programming. For example, all of Hypercard's visual effects can be samples on a single card and can be attached to any other card without programming.

Each product is priced at $99.95 and will be sold through Mac distributor Bonsu Corp. or Softworks.

Compulink hits integration market with optical system

BY J. A. SAVAGE
CW STAFF

TORRANCE, Calif. — Compulink Management Center, Inc. recently made its debut in the systems integration market by putting together several increasingly popular storage and retrieval technologies: optical scanners, laser printers and write-once read-many (WORM) optical storage.

The Laserfiche 3000 series is based on an Intel Corp. 80386 32-bit processor running at 20 MHz. It has 2M bytes of main memory and 340M bytes of hard disk space, with another 800M bytes in WORM optical disk storage and 60M bytes of cartridge streaming-tape drive. The system, which also includes an optical character recognition scanner and a desktop laser printer, lists for $39,900.

Individual parts in the system, such as the central 386 processor, may come from any number of manufacturers, depending on the preference of the user, according to a Compulink spokesman. The operating system is Microsoft Corp.'s MS-DOS 3.3.

The system allows hard copy to be entered into storage via the optical scanner, which recognizes eight- to 24-point type at 40 char./sec., according to Compulink.

Search and retrieval is performed by scanning all documents in the data base with the same three or more letters in the title. Once a document is located, two simultaneous searches for unrelated words or phrases may be made in a block of text as small as 10 lines or anywhere within a single document.

Data may also be input through modems and facsimile boards or mainframe interface systems, such as Digital Equipment Corp.'s Decnet or IBM's Systems Network Architecture.

Laserfiche is currently available.

Finkelstein

FROM PAGE 35

and 1-2-3/Mac. Lotus also announced it will build Blueprint drivers to link 1-2-3 to Lotus DBMS, Ashton-Tate's Dbase and IBM's DB2.

Other vendors have announced their own Blueprint drivers. Synex announced a Blueprint driver for Microsoft's SQL Server. Must, with Nomad, Relational, with Ingres, and Oracle have all pledged Blueprint support. Users of 1-2-3 will be able to access any or all of these DBMSs either locally on single-user workstations or remotely on multiuser networks.

For the ultimate in transparency, organizations may want to implement a distributed data base architecture linking Lotus products to all corporate data.

But this is just the beginning. Lotus has only announced support for its 1-2-3 family so far, but we can look forward to future announcements that will bring other Lotus products such as Agenda, Notes and Freelance into the Blueprint fold. Together, these products form a powerful base for developing advanced application solutions that will merge graphics, images and audio processing.

To make this scenario a reality, developers need a language that can blend hypermedia functions into a seamless application using high-level, object-oriented instructions. Lotus realized this and developed Lotus Extended Application Facility (LEAF), which combines the strengths of traditional development languages with the additional capability of accessing 1-2-3's statistical and graphical functions. Direct access to 1-2-3 functionality is a boon to developers.

Future releases of LEAF may extend its capabilities even further so that developers have access to any number of rich, object-oriented capabilities that may exist in Agenda, Freelance, Notes or other yet-to-be-announced Lotus products.

Get the picture?

There are many types of applications that can be greatly enhanced by images, graphics and audio. Real estate, catalog shopping, inventory control, computer-assisted instruction, computer-aided design and manufacturing and desktop publishing are some examples. Storing image, audio and graphic data types in a data base requires specialized relational DBMSs, such as those offered by Empress Software and Interbase. These DBMSs can use their SQL capabilities to link into the Blueprint environment and provide back-end data base support for hypermedia types of applications.

Without Blueprint it would be time-consuming and prohibitively expensive for each vendor to design its own interfaces to front-end applications. Blueprint allows DBMS vendors to concentrate on solving the back-end issues, leaving the front end to Lotus.

Blueprint is an evolving specification. Currently, it has full relational capabilities that are a superset of standard SQL. It can directly support standard SQL commands, and it can also support nonstandard SQL extensions such as the outer join. DBMS vendors can choose to use a subset of the Blueprint specification in order to access nonrelational DBMSs such as IBM's IMS, Information Builders' Focus and SAS Institute products. Connectivity products such as Lotus's The Application Connection, Network Innovation's CL/I and Gupta Technologies' SQLnet can be used with Blueprint to link data bases in heterogeneous DBMS environments.

Is everything right with Blueprint? Unfortunately not. It is only open at the back end. While any DBMS vendor is free to participate on the back end, only Lotus can provide front-end application software. The user community will therefore be dependent on Lotus to build products that can make full use of Blueprint's potential. This may change in the future. Lotus may enter into partnerships with other third-party developers, or other vendors may choose to compete directly against Blueprint with alternative specifications open on both ends.

Blueprint presents exciting possibilities. Developers will be able to build applications that were previously out of reach while end users will benefit from better user interfaces, increased productivity and greater flexibility. Current 1-2-3 users are assured of a migration path into this next generation of application solutions.

Lotus has laid out an architecture that should be of interest to anyone who believes that foresight and a solid foundation are essential to maximizing the benefits of microcomputer automation.

Finkelstein is president of Performance Computing, Inc., a company specializing in relational data base technology.

Recovery package bows

CUPERTINO, Calif. — Symantec Corp.'s Turner Hall Publishing division last week unveiled a data recovery package based on Micro Analyst, Inc.'s Maczap. Earlier this year, Symantec agreed to jointly create an enhanced version of the program.

The enhanced product is called Symantec Utilities for the Macintosh (Sum) and will feature an easier to use recovery procedure for storing crashed disks, "deinitializing" hard disks and recovering files that were accidentally deleted.

Other features include disk partitioning and optimization, faster floppy disk duplication and file and disk viewing and editing.

Sum provides utilities for recovering from almost any type of disk crash, a spokesman said. Data can be recovered onto floppy disks or onto another hard disk drive. One of the program's more advanced features is called Guardian and can be preinstalled on any disk.

Guardian allows users to recover from any type of disk disaster in minutes, the company claimed. Guardian also has a module that prevents any computer virus from attacking the system.

Sum requires a Apple Computer, Inc. Macintosh 512KE, a Mac Plus, a Macintosh SE or a Mac II. Macintosh System Version 4.1 and Finder 5.3 or higher are also required.

The program carries a suggested retail price of $99.95 and has a 30-day money-back guarantee.

Progress

FROM PAGE 31

lar Progress syntax or mix and match both types in a single procedure.

By combining SQL syntax with Progress's screen and report formatter, developers can code standard SQL statements while simultaneously accessing Progress presentation display capabilities, according to Chip Ziering, the company's vice-president of development.

Progress has sent to customers the first review copies of the program with SQL support. Along with SQL support, the firm will add other enhancements to the program, but it declined to say what those would be.

Progress's version of SQL will conform to ANSI standards, according to Chad Carpenter, the company's vice-president of sales.

"Our SQL offering reinforces our commitment to enhance the program's application development capabilities by incorporating industry standards," he said.

Progress can be ported to multiple software environments, including Digital Equipment Corp.'s Ultrix and VAX/VMS, Microsoft Corp. MS-DOS, Unix, Xenix and CTOS/BTOS operating systems, as well as local-area networks.

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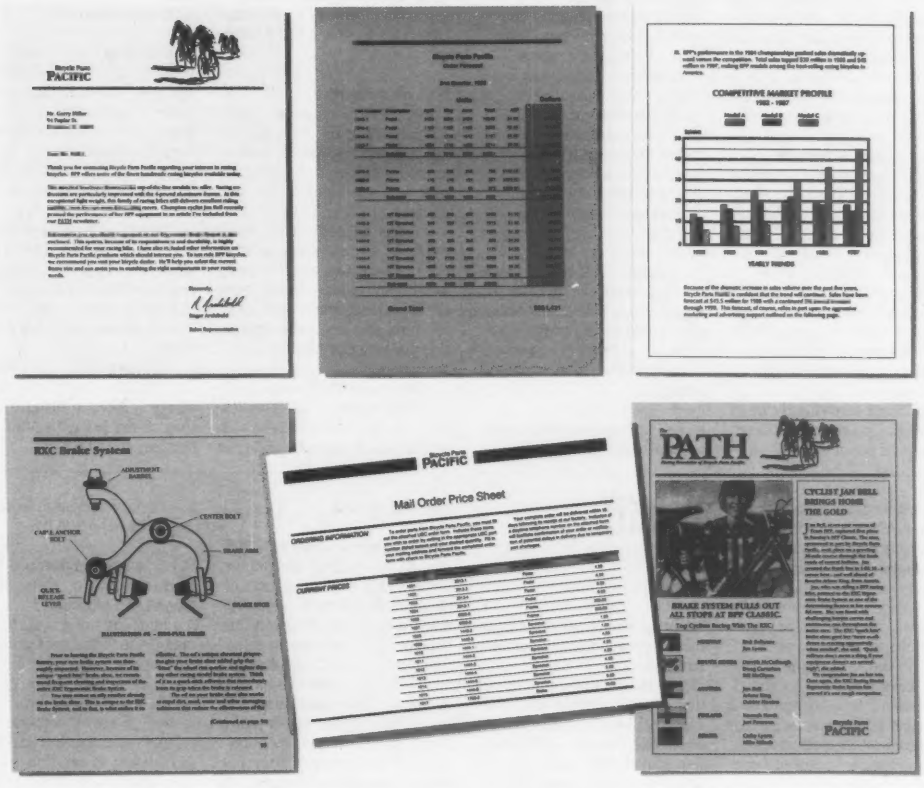

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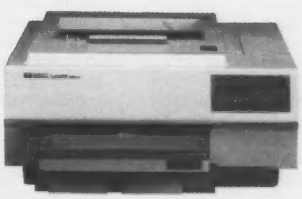

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Print samples were created using Microsoft Word, Microsoft Excel, and Aldus PageMaker.

Barney

FROM PAGE 31

munications and SDLC on a PC bus without an expensive adapter; you can on a Micro Channel.

For certain I/O tasks, the Micro Channel may be just the ticket. On the older PCs, "if I get control of a bus and issue a start I/O, absolutely nothing else happens until I relinquish the bus. With a Micro Channel, I can have up to 255 start I/Os," Kamerer says. Why should we care? "This really comes into play if you are running a print job and communications together," Kamerer explains.

Another crack at 1-2-3. With Borland and Microsoft already going after the spreadsheet leader, Ashton-Tate must feel a bit left out. That at least may be the reason that the don of micro data bases is hatching plans to infiltrate the integrated spreadsheet market. Under the auspices of a new business unit, Ashton-Tate is at work on a spreadsheet that uses technology pioneered by Framework and also plans to enter the low-end integrated market pioneered by Software Publishing.

Just say no to Presentation Manager. That is what Lotus founder and former employee Mitch Kapor did in a speech recently that surprised users and Lotus officials. According to Kapor, some of the things he and others may pioneer will make the Presentation Manager obsolete. But just what Kapor has cooking is still unclear.

Risky patent business. IBM's plans to collect patent fees from firms attempting to license the function of its Personal System/2 raised some interesting and unexplored issues.

Ironically, IBM is not collecting royalties on PS/2 patents but rather is licensing what the lawyers call trade secrets. IBM hasn't received its patents on the PS/2; it has simply applied for them.

IBM must tread lightly when pressing its patent case. There are several possible pitfalls in the form of esoteric legal doctrines. One doctrine is a bit complex but may come into play. Here is the scenario: Let's say IBM has a patent and knows that someone is infringing but fails to take action. Then there is a confrontation, and the infringer openly tells IBM it is going to proceed. IBM counters by saying, "You are infringing" but again fails to act. Then IBM will have lost its patent rights.

Another doctrine says that if IBM knows people are infringing but fails to act against them within six years, it loses its rights. Only time will tell whether any cloners will be protected by these doctrines.

Perhaps the more critical issue involves unfair competition or discriminatory licensing. If, for example, IBM is forcing people to get a second group of patents because IBM feels it needs a license on the first group, this could be antitrust or a patent misuse problem, one patent attorney says.

Barney is a *Computerworld* senior editor, microcomputing.

ABCs

FROM PAGE 35

veloping an inventory management data base on a CP/M program. Frustrated by the lack of CP/M support and the inability to expand the data base, he chose D over big-name competitors such as Ashton-Tate Corp.'s Dbase for its speed and flexibility.

Not all smooth

There have been a few minor glitches along the way, according to Keen. However, overall, he said, Caltex has corrected most shortcomings in periodic updates.

"I was an early user, and I called up to tell someone what the problem was, and if it was a lack in the language itself, in every case they came up with an interim fix and would incorporate that fix into the next release," Keen said.

Walter J. Walvick, a partner in the Washington, D.C.-based law firm of Dickstein, Shapiro & Morin, said D offers flexibility in determining how the information in a data base is stored and retrieved.

"For years I was looking for a PC data base that would come close to a mainframe system," he said. With D, he added, "You can do what you want to do and are not set into predefined ideas about the way the data should look and be grouped."

Improving

Walvick, also an early user of D, said the program has become more sophisticated in the last year. "It was rough in the beginning, because there weren't many bells and whistles. But it has improved enormously," he said.

Walvick maintained that an end user should have fairly strong PC experience to fully use the data base and complained that the program itself could use a good end-user, menu-driven interface.

"There probably are simpler data bases out there somewhere," Keen concluded, "but they're not going to offer what this package does."

Adventists

FROM PAGE 35

plement that in an automated fashion."

Finding an accounting package is easy, but finding one that could work as well in a remote location with low-cost IBM Personal Computer compatibles as it could in London on a PC running under Unix was a challenge.

"There was quite a difference in the technical level of people and equipment to consider," Haney said. So he solicited the user groups for suggestions.

What worked, he said, was Systems Union Ltd.'s Sun Account package. The London-based company's package was in use at a Seventh-day Adventist Church installation in the Ivory Coast in Africa, and after seeing it, Haney found it met many of the Adventists' needs.

The multicurrency issue was a critical one, Haney said. Seventh-day Adventist Church organizations worldwide send debit and credit vouchers and funds back and forth to headquarters and to each other, he explained.

Another critical issue was the package's flexibility regarding hardware and software. "We're producing one set of code, making any changes that we need from here, and having it run on different environments around the world," Haney said.

The environments include IBM PCs and compatibles running DOS, Unix or variations of Unix; networked environments; and some minicomputer environments, Haney said. "It has to be compiled with the program's run-time module," he said. "The way Systems Union put it together with their kernels in the program, 99% stays intact. Everything is there to run on every system and you're just activating it to run accordingly."

Working with Systems Union was tricky at the start, but problems were quickly resolved, Haney said. "In the initial phases, it seemed like it would be teams of lawyers talking to each other, but it wound up being myself and one of their directors."

The two sides reached a special source agreement that allows the Adventists to make some changes to Sun Account. "They treat us like a master distributor, which has special programming rights," Haney said. The church can distribute the program only to its own organizations and plans to provide 500 copies to locations worldwide, Haney said.

Some of those locations include churches and related groups; hospitals; publishing houses; food service organizations; the Adventist Disaster Agency; and the largest Protestant school system in the world, which includes kindergarten through 12th-grade as well as universities, Haney said.

With the church growing rapidly, the accounting package is more a necessity than a luxury, Haney said. This year alone, he said, the 140-year-old, five-million-member church will sign on about one million new members.

Training on the system will take place in Washington for the church's divisional MIS leaders, who will then continue the training at other levels, Haney said.

Approximately 50 Adventist groups are currently using the system, and the primary launch will be held in July.

Ratliff

FROM PAGE 35

tional types of things.

Why is the initial version missing an SQL implementation?

SQL turns out to be a lot harder than we ever expected it to be. The [SQL] development started in late September 1986, and I was told at that time that we would have a prototype by January 1987, and then it was June '87, and then it was October, November, December.

Then it was by March 15 of this year, and now it's still several months away. We're making progress, it's just that it's an elusive goal.

So you're close to acquiring an SQL product?

Yes. It's an SQL processor with source code that we can adapt in a variety of different ways. . . . An engine is one of the ways we're going to adapt it. The SQL engine will be an additive alternate to the existing Emerald Bay engine.

What is your view of SQL?

It's an interesting alternative, but I think it's been pushed a little too hard. Thirty percent of all data base activity ultimately may become SQL. SQL has an important place, but it's not going to be 100% of everything. Very few of our customers are waiting for SQL. People want to know that SQL is coming — they don't want to use it today, they just want to know that it's coming in the future. It's much like OS/2. Nobody wants to switch over to OS/2 today, but they want to make damn sure that it is going to be in your product future.

Why does the world need another data base?

The world really needs a good network-oriented data base system, and Emerald Bay has been developed with networks in mind since day one. With Dbase it was kind of Band-Aided on the back end at the last minute. And it's a very poor solution in my mind. Emerald Bay is essentially multilingual in that you can write a variety of user interfaces that can still use the data base.

Who is using Emerald Bay, and what do they think about the product?

It's been kind of a surprise. We thought it would be third-party developers, real end-user application developers. But there's been a much higher level of attention given by corporate developers than we ever expected, and Migent is starting to shift their marketing focus to look more toward the corporate world.

What is your opinion of Dbase IV?

It looks like an enormously huge product, and that is exactly what I tried to avoid with Emerald Bay. Dbase IV has a lot of glitter, but again, I suspect that they've spent more time on user interface than they have on the technology foundation. But I've seen only about 15 seconds of it. I told the guy who was trying to show it to me, "No, I really don't want to see it — I'd rather stay a virgin."

Engine

FROM PAGE 31

can store more data in less space, and the tricky problems of referential integrity — making sure data updates are recognized by all related files or tables — are easier to solve, according to one user familiar with the firm.

The technology is scheduled to debut in the form of a data base engine later this year and will run on the IBM Personal Computer AT. It will come standard with a coprocessor board for caching capability. Rather than sell the product directly to users, Nucleus will rely on OEMs to resell the system.

So far, no OEM deals have been announced. "We are in discussions with two large companies that may become strategic partners," McLeish said.

But Nucleus will not rely entirely on OEMs to build front ends for its product. The firm will ship Nucleus Builder, an environment for C programmers that can be configured to look like a variety of word processors or spreadsheets. In addition, users can configure the system to their own specifications.

Nucleus Builder also serves as an interactive SQL facility that can create data bases that are modified on-line.

In addition to the AT version, Nucleus is planning to ship versions for Digital Equipment Corp.'s VAX/VMS and Unix. The firm also said it plans to develop an IBM MVS version later this year and will also target Unix on mainframes.

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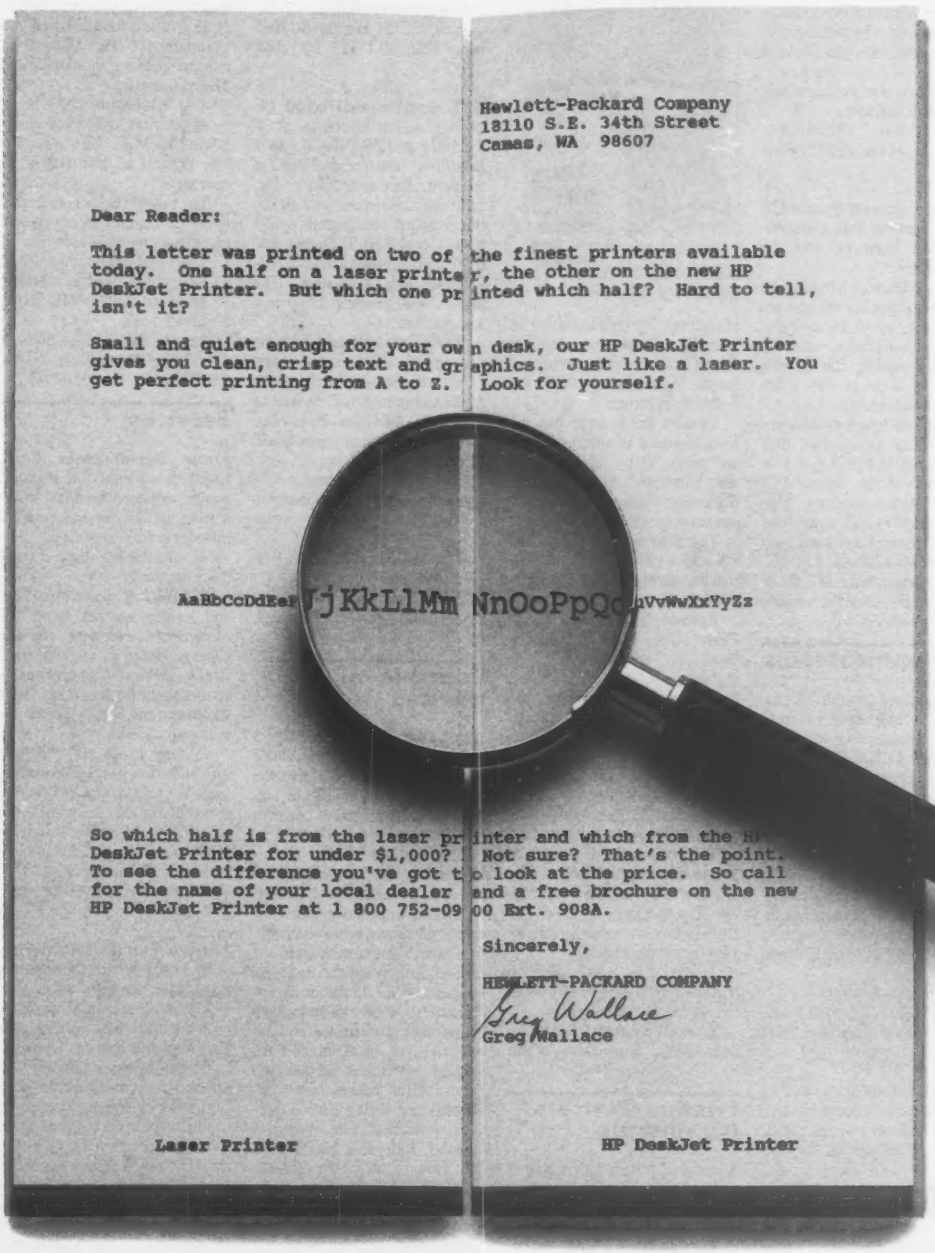
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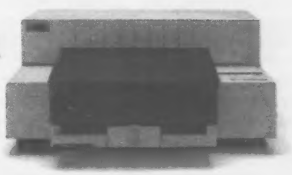

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NEW PRODUCTS

Systems

Zenith Data Systems has introduced two Intel Corp. 80286-based desktop personal computers.

Called the **Z-248/12** and the **Z-286 LP**, both systems have 1M byte of random-access memory and include 256K bytes of Lotus/Intel/Microsoft Expanded Memory Specification for addressing memory above 640K bytes.

The Z-286 LP reportedly weighes 17 pounds and measures 3.9 by 14 by 15 in. The system is available with a 40M-byte hard drive and a 1.44M-byte floppy drive. The chassis has a cover lock to guard against tampering inside the computer. The Z-286 LP costs $3,999.

The Z-248/12 is available with a 40M-, 80M- or 160M-byte hard drive and a 1.44M-byte 3½-in. floppy drive. A single-floppy drive version with either the 3½-in. drive or a 1.2M-byte 5¼-in. drive is also offered. The 35-pound system costs from $2,999 to $6,799, depending on memory configuration.

Zenith Data Systems, 1000 Milwaukee Ave., Glenview, Ill. 60025. 800-842-9000

Software applications packages

Micromath Scientific Software has announced **Minsq 2.3** for nonlinear curve fitting and model development.

The enhanced version comes with an expanded and largely rewritten manual, and the graphics capability now includes Adobe Systems, Inc. Postscript plot descriptions. Linear parameters are identified algebraically and are solved during the model fitting process by default. The interactive graphics section provides facilities for annotating with text, lines and arrows.

The product requires 512K bytes of memory, two floppy drives and a high-resolution monochrome graphics adapter or an IBM Color Graphics Adapter and Enhanced Graphics Adapter card.

Minsq 2.3 costs $179.

Micromath Scientific Software, 2034 E. Fort Union Blvd., Salt Lake City, Utah 84121. 801-943-0290.

Skok Systems, Inc. has enhanced its microcomputer-based computer-aided design package, **Drawbase. Version 105** has been updated to include three-dimensional shading capabilities that allow the user to fill 3-D planes and show the effect of a light source on the model.

Other modules include an integrated text editor, an enhanced DXF import/export capability and an expanded Skok Drawbase programming language. Hardware supported has been expanded to include the IBM Personal System/2 8514A co. troller and the Genoa Super-EGA controller in a video graphics array mode. The product also supports the Hewlett-Packard Co. Series 747 pen plotters.

The Drawbase modules cost from $495 to $4,995.

Skok Systems, 222 3rd St., Cambridge, Mass. 02142. 800-225-7565.

A software program designed to process surveys and questionnaires has been released by **Masterware**.

Survey Master allows up to 75 questions per survey and accommodates up to 10 user-defined multiple-choice answers for each question. Bar graphs and pie charts are generated for response analysis.

The menu-driven system requires 286K bytes, two disk drives and IBM PC-DOS 2.1 or higher. It will run on any PC-DOS or Microsoft Corp. MS-DOS machine as well as on IBM Personal System/2 computers.

Survey Master costs $34.95.

Masterware, Suite 177, 3213 W. Wheeler, Seattle, Wash. 98199. 206-284-1762.

Development tools

A tool designed to assist C programmers in object-oriented software engineering has been announced by **CNS, Inc.**

C-Talk is an object-oriented programming environment that extends the C language by adding encapsulation, inheritance and a messaging mechanism. Engineers work within the object-oriented paradigm. The product operates on IBM Personal Computers or compatibles with a minimum of 512K bytes of memory.

C-Talk costs $149.95.

CNS, 7090 Shady Oak Road, Eden Prairie, Minn. 55344. 612-944-0170.

Gold Hill Computers will port its **Goldworks** expert system building tool to Sun Microsystems, Inc.'s 386I series workstations.

The menu-driven system has a knowledge-based inference engine that uses forward, backward and goal-directed forward chaining to reach conclusions. Goldworks has an on-line tutorial and Help system.

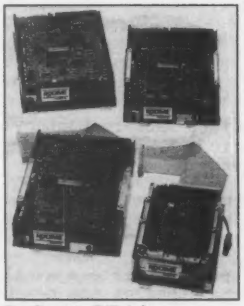
Goldworks runs on top of Sun Common LISP. It will be offered on the Sun 386I for $4,995 for quantities of three or more.

Goldworks cost $7,500 per single copy.

Gold Hill Computers, 26 Landsdowne St., Cambridge, Mass. 02139. 617-621-3300.

Data storage

Rodime, Inc. has announced mounting hardware that will allow its **RX series** of internal hard drives to operate with either the Apple Computer, Inc.



Rodime's *RX drives*

Macintosh SE or Macintosh II. The RX series now contains drives and mounting hardware for the 5¼-in. 60M-, 100M- and 140M-byte drives.

Dealers will receive two different sets of mounting frames and cables with each RX series disk purchased. Upon request, Rodime will upgrade drives purchased before the enhancement.

The Rodime 600 RX, 1000 RX and 1400 RX have respective list prices of $1,795, $2,195 and $2,495.

Rodime, 901 Broken Sound Pkwy N.W., Boca Raton, Fla. 33431. 305-994-6200.

Emerald Systems Corp. has introduced two 5¼-in. **half-height cartridge tape drives**, available in 60M- and 150M-byte capacities.

The drives reportedly can be configured on local-area networks, DOS and Xenix systems.

The half-height drives incorporate all Emerald Systems proprietary tape functions, including Asp software in DOS and LAN configurations, which allows unattended backup.

The 60M-byte internal drive costs $1,295, and the 150M-byte drive costs $2,095.

Emerald Systems, 4757 Morena Blvd., San Diego, Calif. 92117. 619-270-1994.

Printers/Plotters/Peripherals

A series of 35mm film scanners supporting both the IBM Personal Computer and Apple Computer, Inc. Macintosh II environments has been announced by **Howtek, Inc.**

The **Scanmaster/35** scans and digitizes 35mm film for display and storage on an image-capturing computer. Input film can be in the form of positives or negatives and in mounted or strip form. The Scanmaster/35 has a resolution of 2,000 by 2,000 dot/in. and 180 degree rotation capability.

The **Scanmaster/35 II**, with resolution of 2,000 by 3,000 dot/in., was designed for medical imaging and high-quality retouching. **Scan-It/35** software is available with each device and allows user preview and subset selection capabilities.

List price for the Scanmaster/35 or Scanmaster/35 II with Scan-It/35 software is $8,195. Hardware costs $6,995.

Howtek, 21 Park Ave., Hudson, N.H. 03051. 603-882-5200.

AST Camintonn Digital Division has introduced the **AST Turbolaser/PS-Plus 3**, an 8 page/min. laser printer with a resident Adobe Systems, Inc. Postscript controller and an optional board for Digital Equipment Corp. LN03, Diablo 630 ECS and Hewlett-Packard Co. Laserjet Plus emulation. The printer will produce both text and graphics.

The product includes 35 fonts and an RS-422/Appletalk port, which makes it compatible with Apple Computer, Inc. as well as IBM and DEC environments. The 12.5-MHz controller board incorporates a Motorola, Inc. 68000 microprocessor, 3M bytes of random-access memory and 1M byte of read-only memory.

The AST Turbolaser/PS-Plus 3 costs $5,495.

AST, 2121 Alton Ave., Irvine, Calif. 92714. 714-553-0247.

Board-level devices

Ariel Corp. has entered into a licensing agreement with AT&T Bell Laboratories that allows the former to market **Sysid**, an acoustic measurement system for IBM Personal Computers and compatibles.

Sysid can measure two independent channels simultaneously, making impedance and ratiometric measurements possible.

The system can be used for transducer testing and analysis, room acoustics, vibration analysis, auditory research and a variety of other applications. Sysid is composed of an Ariel DSP-16 single-card Data Acquisition Products, Inc. processor and Sysid software.

Sysid costs $2,995.

Ariel, Suite 404, 110 Greene St., New York, N.Y. 10012. 212-925-4155.

Quadram Corp. has extended the memory capabilities of the **Quadboard PS/Q** and the **Quadmeg PS/Q**. Both products now support up to 4M bytes of memory and provide compatibility with IBM and Microsoft Corp.'s OS/2 extended memory.

The enhancement boards can be configured from 512K to 4M bytes per board and have switch-selectable IBM Micro Channel identification to prevent conflict with other boards installed on the computer. Both run on IBM Personal System/2 Models 50 and 60.

The Quadmeg PS/Q costs from $395; the Quadboard PS/Q costs from $595.

Quadram, One Quad Way, Norcross, Ga. 30093. 404-923-6666.

A 24-MHz Intel Corp. 80386 system board for IBM Personal Computer AT-class machines is now available from **American Micronics, Inc.**

The **Elephant 386** is offered in three configurations: 16, 20 and 24 MHz. All are reportedly capable of zero-wait state operation.

The board has sockets for 2M bytes of random-access memory, expandable to 10M bytes.

The 16-MHz version will cost $1,949; the 20-MHz version, $2,592; and the 24-MHz board, $3,120.

American Micronics, Suite A, 18005 Sky Park Circle, Irvine, Calif. 92714. 714-261-0693.

Services

Lotus Development Corp. has updated Signal, a personal computer-based financial information service for independent investors that reportedly provides current real-time market information.

Signal 2.0 adds mutual fund and money market data, the Midamerica exchange and the Chicago Board of Trade Market Profile service. Comprehensive coverage of the American Stock Exchange and NASDAQ indexes is also provided.

Current users may upgrade for $55. The suggested retail price is $595 for the FM receiver and Signal software; the monthly Lotus subscription fee is $80.

Lotus, 55 Cambridge Pkwy., Cambridge, Mass. 02142. 617-577-8500.

Ziff Communications Co. has announced a personal computer-based information product that will be delivered to subscribers on a monthly basis in compact disk/read-only memory format.

The **Computer Library** was developed in conjunction with Lotus Development Corp. to be used as a reference and analysis tool. The service will provide the most recent 12 months of 10 leading computer industry journals in full text, as well as computer-related articles from 120 computer, communications, electronics and business periodicals. An IBM Personal Computer, PC XT, AT or compatible with a hard disk and IBM PC-DOS or Microsoft Corp. MS-DOS 3.1 or higher is required.

The Computer Library costs $695 for a one-year subscription.

Ziff, One Park Ave., New York, N.Y. 10016. 212-503-4400.

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At under $1,300, the HP ColorPro Plotter may be just where you want to start. It will turn your ideas into colorful, easy-to-grasp visuals. Or, if you need to combine near-letter quality text with color graphics, you can rely on the HP PaintJet Color Graphics Printer for under $1,400. Whichever you choose, you'll create desktop presentations with startling color and greater impact.

For a colorful sample overhead and the name of your nearest dealer, call 1 800 752-0900, Ext. 903A.

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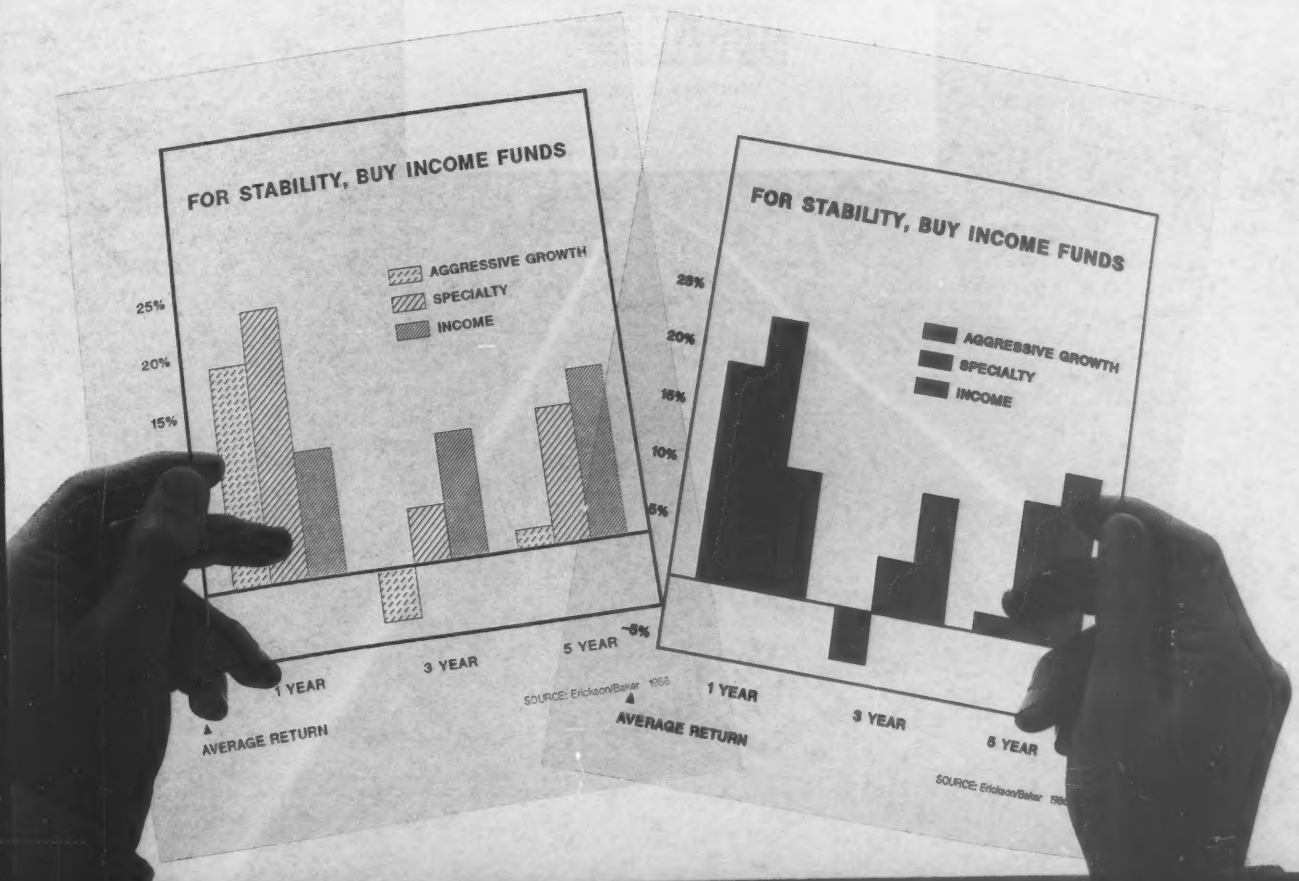

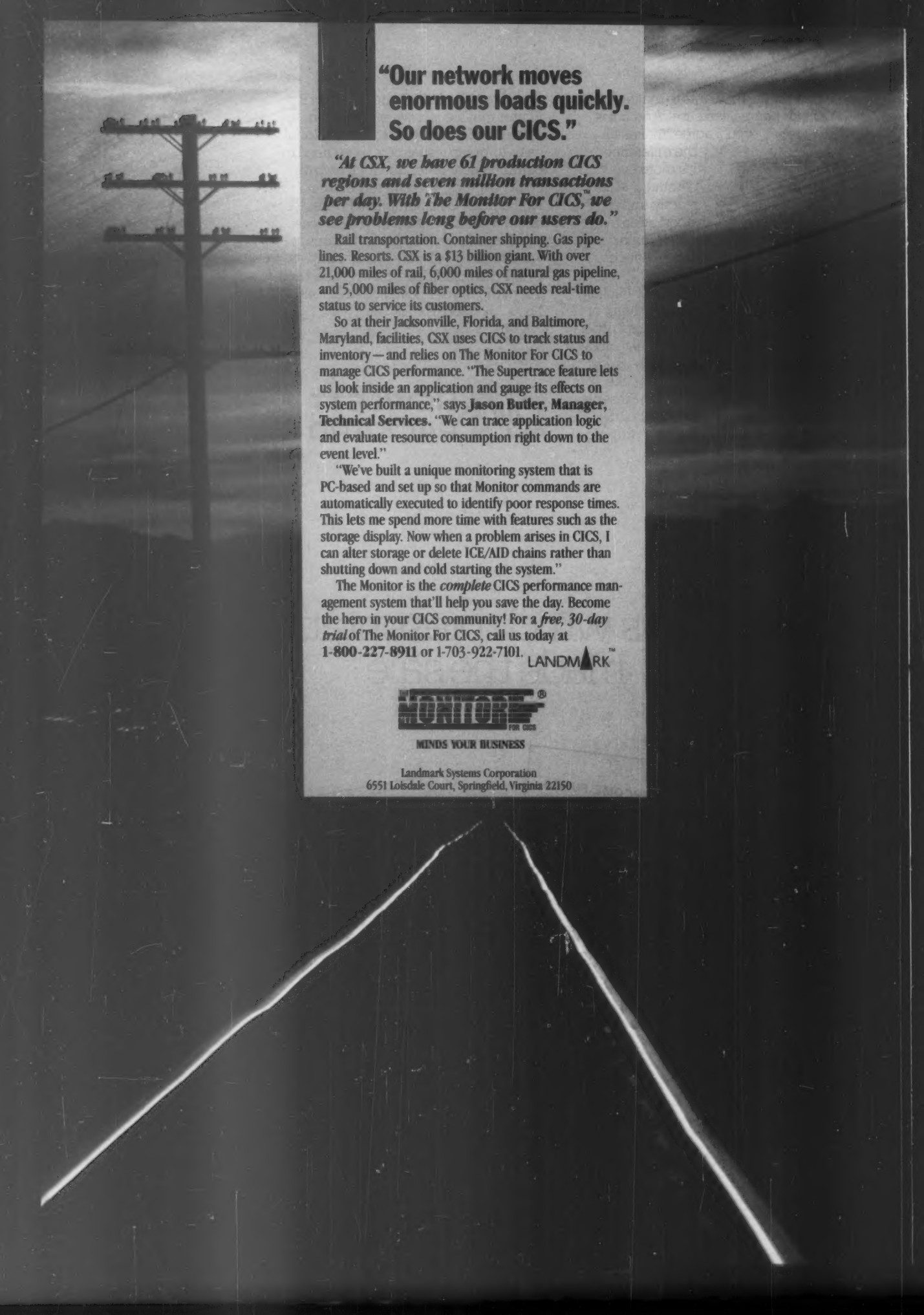

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DATA STREAM

Thomas White

Is Apple a serious player?

First of a two-part look at Apple's connectivity strategy

When Apple Computer, Inc. first introduced the Macintosh, one of the unheralded features of the system was the network interface card built into each machine. This feature was later scorned by many because of its low speed. However, users then discovered they could print documents on a laser printer over this network quite nicely. In fact, with the introduction of Aldus's Pagemaker, they could indeed perform desktop publishing.

Early Mac users were soon printing their documents over this low-speed, easy-to-install network in great numbers, but they were not network users. Eventually, they moved on to do other things common to network users, such as file transfer and print spooling. So last year, Apple took the next step and offered a file server-based network system, Appleshare.

With the possibility of local networking now ensured, is Apple a player in the bigger world of connecting these work group networks to other non-Apple

Continued on page 47

Deere reaps MAP, CIM benefits

Investment of $2.5M in broadband cable adds speed, cuts overhead

BY JEAN S. BOZMAN
CW STAFF

MOLINE, Ill. — Deere & Co., which has been shaping steel into plowshares, combines and tractors for 150 years, has used the Manufacturing Automation Protocol (MAP) to streamline its operations here.

Since 1985, Deere has invested $2.5 million in placing MAP broadband cable at six Midwestern plants, including the 75-year-old Harvester Works.

MAP has succeeded in reducing time-to-market from five to two years, said Paul F. Ohman, vice-president of engineering, information and technology at Deere.

"Now we're able to react more quickly to changes in the market," Ohman said. "Design changes that used to take several months can be made in one day. Retooling takes less time, and fewer employees are required to do a given job."

Perhaps more important, by using MAP together with computer-integrated manufacturing (CIM), Deere was able to reduce its Harvester Works overhead to just 35% of sales, Ohman said. That amounts to a 50% reduction in the break-even point compared with 10 years ago.

"We realized massive savings in tooling and setup," Ohman said. Those savings helped Deere turn its business around. Faced with a shrinking farm market, Deere said it can leverage its technology to regain profitability this year. Last year, the company lost $99 million on $4.1 billion in sales.

Deere has also discovered that the MAP-CIM combination shrinks space and time requirements. Where 10 machines had been used for metal-stamping component parts in 1984, today just two machines do the job, said Jerry Van de Voorde, manager of sheet metal engineering at the Harvester Works.

"We've consolidated our metal cutting, which used to require five to six operators," he said. Future plans call for just one system operator for every two metal cutting machines.

MAP 2.1, first installed at the Harvester Works in October 1986, is the protocol used to route the stamping instructions from a set of engineering workstations off the shop floor.

"Today, we can cut more parts on the same sheet of metal through the use of CAD/CAM and numerical control opera-

Continued on page 44

Users urged to integrate

BY PATRICIA KEEFE
CW STAFF

If you think MAP/TOP is just for the factory floor, guess again.

The rewards of the Manufacturing Automation Protocol/Technical and Office Protocol suite are best reaped when harvested on an enterprisewide level, according to "MAP/TOP: A Business View," a study on business issues prepared by the Business Case Special Interest

Continued on page 46

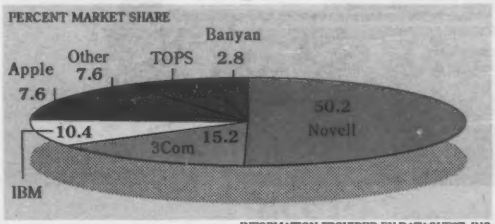
Inside

- Microsoft, IBM skirt OS/2 controversy. Page 44.
- Microsoft's OS/2 LAN Manager goes into beta test. Page 45.

Data View

Novell leads net software pack

Vendors' 1987 market share figures are based on the number of personal computers linked to nets running a particular network operating system



INFORMATION PROVIDED BY DATAQUEST, INC.
CW CHART

Sifting Chicago telco ashes

MIS ponders security measures as smoke clears

BY JEAN S. BOZMAN
CW STAFF

ANALYSIS

CHICAGO — In 1871, it was Mrs. O'Leary's cow that caused a fire disaster that affected nearly everyone who lived in Chicago. Now, 117 years later, another fire in the Windy City that few felt or even knew about managed to destroy something else — a sense of security about our nation's telephone networks.

When fire broke out on the afternoon of Sunday, May 8, there was no one at the Illinois Bell switching station in Hinsdale, about 20 miles west of downtown Chicago. As the station is unattended on weekends, the fire went unobserved for half an hour — until a console operator in the state capital 150 miles away noticed a fire alarm.

By the time local firemen ar-

Continued on page 45

Can Your Unix DBMS Guarantee Data Integrity?

Data integrity is essential for any commercial application. Unfortunately, no Unix-based DBMS product is able to provide absolute data integrity without sacrificing performance or forcing the use of complicated raw devices. Except the ORACLE® RDBMS.

The Problem

The Unix operating system uses a RAM buffer cache to hold data which is written to, and read from, the disk. This reduces I/O and enhances performance. In database applications, however, when you commit data, it must be written immediately to disk. Normally, Unix can only guarantee that your data is in the buffer cache. And since that data is usually written from the buffer cache to disk at undetermined intervals, an untimely system crash or power fluctuation could cause irrevocable data corruption. Of course, this is completely unacceptable in a commercial environment.

The Solution

Unix has a special option called "write-through cache" which allows blocks of data associated with a particular file to be marked for an immediate write to disk; your application cannot continue until the write has been completed. ORACLE uses this feature to guarantee that those blocks of data associated with your database are on disk before the words "transaction completed" ever appear on your terminal's screen. Other Unix database vendors — 1) Don't address the problem at all, 2) Force a complete flush of all data in the buffer cache causing tremendous performance degradation or 3) Require the use of complex raw devices.

Other Unix database vendors

1) Don't address the problem
2) Sacrifice performance
3) Use complex raw devices

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OS/2 LAN Manager out for testing

BY JAMES DALY
CW STAFF

REDMOND, Wash. — Beta-test versions of Microsoft Corp.'s OS/2 LAN Manager recently began trickling out to more than 4,000 owners of its Software Development Kit (SDK).

The SDK version of the OS/2 LAN Manager runs with both MS OS/2 Version 1.0 and the prerelease version of MS OS/2 Version 1.1, which was shipped to SDK owners in April. The LAN Manager begins shipping to OEMs later this month, Microsoft said.

Although the only LAN Manager-specific application — Microsoft's SQL Server back-end data base — is not due to ship until the second half of the year, many of the more than 60 OS/2 applications that IBM claims are currently shipping, as well as any Microsoft MS-DOS-based applications, will run on the beta-test version of the LAN Manager, a Microsoft spokeswoman said.

More applications should be forthcoming, as LAN Manager code has been made available to more than 70 software developers, she added.

"MS OS/2 LAN Manager is currently installed and operating at more than 100 OEM and independent software vendors' sites, providing SDK owners with well-tested, stable code," claimed Steve Ballmer, Microsoft's vice-president of systems software.

This release of the MS OS/2 SDK is the fourth update since the first shipment of the SDK in June 1987, but the company plans to ship more updates to the kit before the final October release of MS OS/2 Version 1.1.

Beta-test versions of the LAN Manager will also be included in the MS OS/2 LAN Manager Developer Pack that will be given to attendees of Microsoft's second series of Advanced Network Developer conferences.

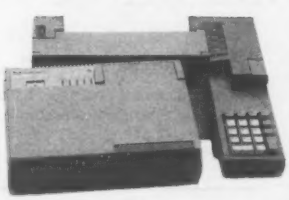
TI's new TravelMate™ LT220.
It's the closest thing to carrying a VAX™ in your briefcase.

Texas Instruments introduces the LT220 lap-top terminal — the next best thing to being there when you need remote access to your company's VAX.

The LT220 provides full VT220 emulation in a 4.8-lb. package, without sacrificing functionality. It features a 25-line screen that's easy to read. It even has a full-function keyboard like the one on a VT220.

The terminal communicates at 1,200 or 2,400 bps through one of its optional internal modems. For hard copy, just slide the LT220 into one of its optional cradles to add an ink-jet or thermal printer.

New credit-card-sized memory cards let you create, update and store files. They're also handy for programming the LT220 to your specific application.



Like its Silent 700™ predecessors, the LT220 sets new standards for portability, durability and reliability. All of which makes it the perfect tool for anyone who's ever wished for a VAX in their briefcase. In short, this may be the best little terminal in the world.

So go ahead. Take the first step toward improving your productivity today. Call Texas Instruments for more information or to arrange a demonstration of the LT220. **Phone toll-free, 1-800-527-3500.**

TEXAS INSTRUMENTS

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Deere

FROM PAGE 43

tions," Van de Voorde said. Deere's Tech Services Group helped develop JD/Nest, a for-sale program that allows a company to nest multiple parts on the same sheet.

Cost-conscious

Harvester Works has 1km worth of broadband cable, according to David C. Scott, a manager at the Tech Services Group.

However, not all layers of MAP have been implemented at Deere. "Our concept is that we will use the technology to satisfy our applications, but we're always looking at what the costs are," one senior manager explained.

Although Deere does not yet use state-of-the-art MAP 3.0, some MAP 3.0 functions can be added later through carrierband technology. The single-channel, data-only carrierband cable will allow MAP 3.0 messages to reach assembly lines and robots throughout the plant, Scott said.

Harvester Works sprawls out across more than four million square feet and houses 13 miles of broadband cable. Deere planners have placed one cable tap for every four shop-floor bays in anticipation of future MAP applications.

So far, MAP applications have included sending manufacturing messages, broadcasting television signals from remote video monitors and transmitting voice signals as part of the plant security system.

The planned addition of network management software will allow Deere to manage all shop-floor networks from a single location, Scott said. Directory services provided through software will guide users around the MAP network.

Multiple devices supported on the MAP network include one Digital Equipment Corp. VAX-11/750, multiple Computervision Corp. computer-aided design systems, network interface units from Concord Data Systems, Inc. in Marlboro, Mass., and various machine tools.

Chicago ashes

CONTINUED FROM PAGE 43

rived, the damage had already been done — 118,000 long-distance fiber-optic phone lines had melted, fused together by intense flames. Another 36,000 data lines were dead, destined to be out of service for more than two weeks. Local service over 35,000 voice lines was completely out, halting the normal traffic of 3½ million calls per day [CW, May 6 and May 23]. Even three weeks later, at the end of the month, normal service had not been restored.

Area MIS managers tried to cope with the crisis by, for instance, rerouting vital links between terminals and mainframes. A handful of firms found their way to disaster recovery sites, while others tried to patch things together with cellular phones, microwave links and portable earth stations.

It did not take long for nagging questions to form in the minds of MIS directors and telecommunications managers suffering through the fire's aftershock.

Many are seriously considering the expense of connecting their systems to two separate central office switches. Still others are looking into ways to bypass Illinois Bell via microwave links to MCI Communications Corp.'s national network, for example.

Silver lining

The saving grace of this disaster is that it served to expose the Achilles' heel of modern telecommunications: Illinois Bell had put all its eggs in one basket.

Building on voice-only networks, Illinois Bell slowly added computer-age technology to the 1962 vintage switching station. Few noticed the metamorphosis or saw the need for computer room safeguards.

Now, according to James Eibel, Illinois Bell's vice-president of operations, in hindsight, the old standards — which stood since the last major Illinois Bell fire in 1947 — will have to be re-examined. "We'll be looking at having 24-hour security," he said, noting that remote operations had become standard in the last 15 years.

Halon fire-suppression systems were never seriously considered, Eibel said, because it was thought they were not needed. Another reason, he said, was size. Central switches are generally large enough to fill a room. Even so, fire alarms were not allowed to ring through to the local fire department. Why? Because Illinois Bell technicians feared Hinsdale firemen would inflict water damage.

It is worth noting that a large number of the regional Bell holding companies also do not use Halon systems.

Whatever the cause — or the cure — the ability of the nation's telephone networks to weather a major disruption must be addressed. In the case of the Hinsdale station — and four more like it in the Chicago area — there was only 25% redundancy in the network, Eibel said. In contrast, Chicago's downtown switches have 50% redundancy. "We can build more redundancy into our system," he said. "It's just money."

Meanwhile, MIS executives are growling about how Illinois Bell really should pay for the damage the fire inflicted. Some of the damage in lost business cannot even be quantified, they claim. Perhaps there will be no payback for all the damage; after all, Illinois Bell is a utility that cannot be put out of business.

But now is the time for MIS managers throughout the country to take another look at their disaster recovery plans — as well as the backup policies of their local telephone companies — in light of what has already happened in Chicago.

DEC deals anchor phone strategy

BY PATRICIA KEEFE
CW STAFF

In the last several months, Digital Equipment Corp. has been busily inking separate pacts with a variety of telecommunications suppliers, forming the basis for a new marketing strategy targeting the local telephone companies and regional Bell holding companies.

DEC has so far signed approximately 14 such agreements with service providers and vendors such as Siemens Data Switching Systems, Inc., Digital Switch, Bellsouth Corp., Telco Research Corp. and Pacific Bell.

The minicomputer maker is hoping to generate new revenue by taking advantage of two trends in the carrier industry: computerization and the loosening of the reins governing divestiture, said Daniel Latham, director of DEC's Telcommunications Industry Marketing Group. This strategy is expected to indirectly impact DEC's commercial users in the form of a wider array of cheaper telecommunications services, he said.

Trust me

In 1984, DEC made the decision not to enter the private branch exchange or Centrex markets. "We are in a position of trust because we aren't competing with them," Latham said, suggesting the same is not true of IBM, which bought Rolm Corp. and owns a stake in MCI Communications Corp.

As a result, DEC claimed it has been able to work out "memoranda of understandings" with a number of telecommunications suppliers involving an exchange of technology information and efforts to jointly provide products to the telecommunications industry.

The move toward computerizing central offices and integrating voice and data communications enables the telecommunications companies to cut costs, thereby cutting prices. "The telcos have gone through a period of maintaining resources and manual record-keeping to a period of automation, where today they have disparate islands of support systems with little sharing of information," said Harry Tankin, a manager at the Telecom Systems Group.

Faced with the threat of bypass, the trend today is for the telecommunications companies to build integrated network management systems capable of providing a global view of their systems, Tankin said.

And as the telecommunications companies and regionals move toward providing Integrated Services Digital Network, Open Network Architecture and intelligent network offerings, DEC's strategy is to be a major player in delivering related computing needs to the providers, Latham said.

Use EDI or lose, council says

BY PATRICIA KEEFE
CW STAFF

SCOTTSDALE, Ariz. — Last month's semiannual meeting of the Uniform Code Council (UCC), which sets electronic data interchange (EDI) standards for the retail industry, was a study in contrast with other recent EDI seminars, most of which attracted hordes of the uninitiated.

Veteran users attending the May 12-13 conference were the ones most likely to tell everyone they had better jump on the EDI bandwagon, or else.

One user said his company told trading partners to provide a plan by year's end detailing a switch to EDI or to expect the relationship "not to prosper," said Thomas Nolle, a consultant and president of CIMI Corp. in Haddonfield, N.J.

The implied threat, he added, was that without an EDI link, hapless partners would find themselves doing business elsewhere by 1989.

Nolle, who attended the UCC meeting, said the approximately 370 attendees averaged three to five years' experience with EDI and represented as much as two-thirds of current EDI volume.

Many attendees conduct almost 100% of their purchase ordering and a significant percent of their invoice activity over EDI, Nolle claimed.

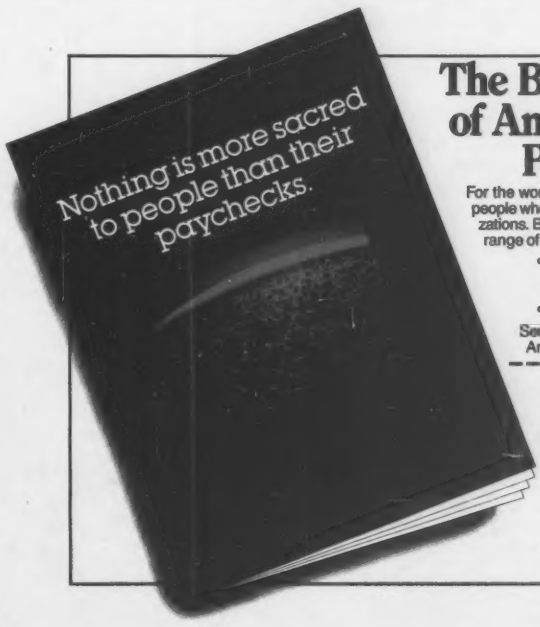
"In the perspective of these people, EDI is a proven financial success in the applications to which it was originally applied," Nolle said. Most are in expansion and consolidation phases.

George Klima, director of accounting systems at Super Valu Stores, Inc. in Eden Prairie, Minn., said his firm is processing 30% of its total invoices via EDI. He said he expects that figure to jump to 80% by this time next year.

The hot news at the meeting was the release of a draft standard for Direct Store Delivery (DSD).

DSD is supposed to reduce "information float" in commercial transactions, similar to check float in a banking system. Today, many buyers and sellers are operating out of sync as invoices, cancellations and orders bypass each other.

DSD allows trading partners to compare quantities and terms at the time the transfer of goods takes place so that problems can be resolved up-front and adversarial relationships avoided, Nolle said.



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Users

FROM PAGE 43

Group (SIG) of the MAP/TOP Users Group.

But it is incumbent on users seeking to benefit from MAP/TOP to push their suppliers in that direction and carefully plan a workable strategy.

Integration of different business systems is key to MAP/TOP, even more significant than network connectivity or expandability, in the view of the report's authors. Enterprisewide integration permits greater control and flexibility of the business's operation, in part because standards let managers better control use of information technology to achieve corporate objectives, the report added.

> "OSI, as implemented by MAP/TOP, is a reality."
>
> MAP/TOP USERS GROUP

Competitive pressures are now forcing companies to integrate disparate applications so networks can share information; yet the barriers to integration are significant.

The report suggests that "we are currently constrained by the web that vendors have woven. . . . The fabric of our business communications networks is of a pattern proprietary to our suppliers, [which] therefore influence our business decisions."

Not surprisingly, users are warned against turning to vendors positioning their own products as de facto standards.

"These are actually proprietary communication systems that only work on the vendors' own equipment. This approach is not a solution at all; it only aggravates the problem," the report said, adding, "the benefits of standardization are lost if everyone follows different standards."

Yet users who wish to take charge of their own destinies will have to face up to the responsibility of telling vendors what they want. The users group SIG maintains that vendors are in fact trying to satisfy their customers but have received little or mixed direction from users as to their intentions for using MAP/TOP. Noting that adopting new standards is expensive and can greatly alter the business strategies of vendors, the report scolded users, saying "vendors require that guidance from their customers."

Instead, the SIG backs international standards, particularly the International Standards Organization's Open Systems Interconnect (OSI) model. It stresses that communications technologies based on international standards are beginning to bridge these islands of information and can also allow for lower network costs and consistent communications techniques throughout a company's business environment.

While the users group maintains that "OSI, as implemented by MAP/TOP, is a reality," it does offer one caveat about other competing international standards. "International standards alone are not adequate, since they each have a variety of options and don't all interact."

Regardless of the route a company chooses to take, the white paper emphasized that MAP/TOP products are available now and made the following recommendations to users:

- Upper level management must actively pursue the implementation of MAP/TOP throughout the company.
- Study the impact of adopting a communications strategy based on MAP/TOP capabilities.
- Become involved in the MAP/TOP Users Group to track and influence the direction of the specification and products.
- Start pilots to get exposure to the technology and validate specific uses. The report noted that data about the actual business impact resulting from MAP/TOP implementations is currently limited. But it later said firms that have implemented MAP/TOP have realized numerous benefits, including cost savings, flexibility and ease of communications between machines.
- Protect existing investments while providing a migration path.
- Educate and train development and support staff.

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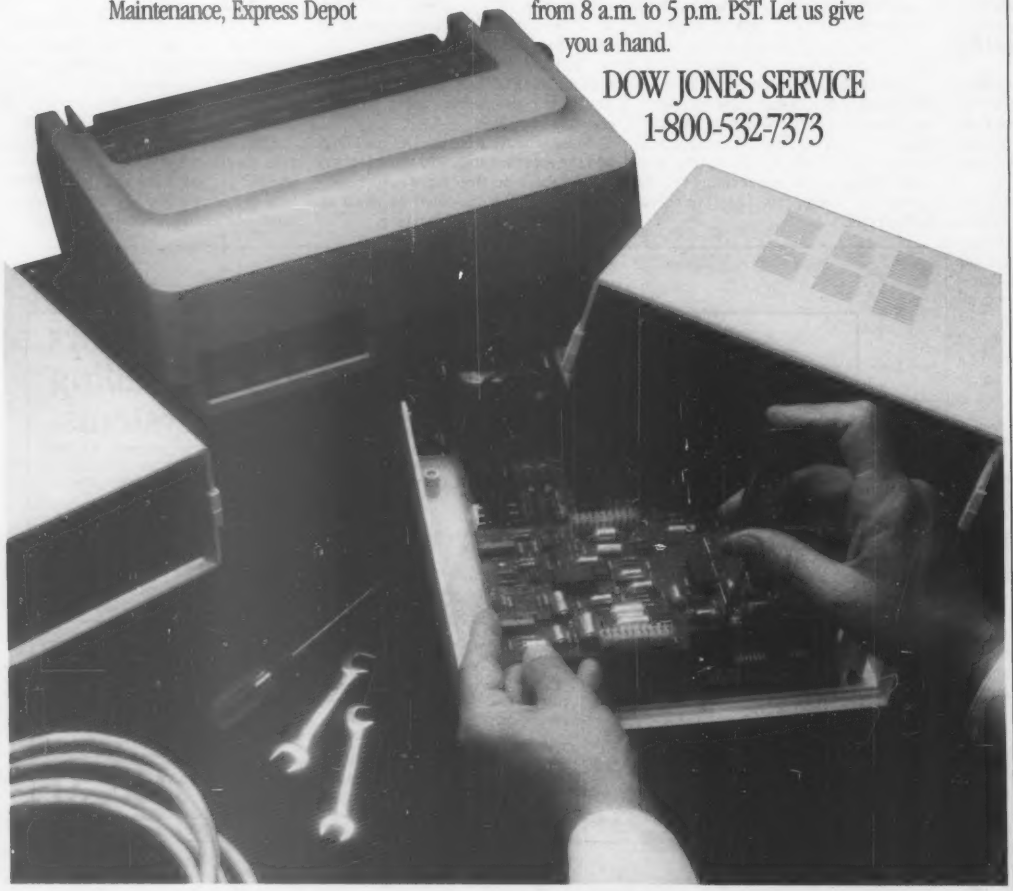

Dbase III plugs into System/38

TORRANCE, Calif. — Ashton-Tate Corp. extended its ability to tap into the IBM mainframe environment with the announcement last week of connectivity software said to plug its Dbase III Plus microcomputer data base management system into data residing on the IBM System/38.

With Dbase Direct/38, users can view, select, sort, display and print data from within System/38 files as if they were Dbase files. Dbase Direct/38 also lets users join up to 32 System/38 files, the company claimed.

The package allows the automatic conversion of System/38 data into Dbase III Plus's .DBF format for use within Dbase programs, making Dbase Direct/38 an application gateway for other personal computer products that support .DBF, the firm said.

Dbase Direct/38 also builds on the Dbase programming language by providing a set of query tools said to allow users to interactively manipulate, display or list details from System/38 files on a field-by-field or record-by-record basis.

Copy capability

The tools also allow users to copy System/38 files and their structures to a Dbase III Plus file, call for selected System/38 data from within Dbase III Plus applications and upload data files to the System/38.

Dbase Direct/38 resides entirely on PCs and works with the System/38-resident PC Support/38, an IBM-supplied utility that connects micros to the System/38.

Dbase Direct/38 is priced at $2,995 per System/38 CPU.

White

CONTINUED FROM PAGE 43

work group local- and wide-area networks? Apple's response to this, of course, is a resounding yes. In fact, Apple Chairman John Sculley has declared 1988 Apple's "Year of Communications." Indeed, Apple has announced some key technology possibilities that are virtually unknown in the user community. Along with other companies, some of which are partially funded by Apple, the possibility of connecting Appletalk to the standard internetworking environments will soon exist.

Interconnectivity

To understand Apple's strategy, we must first look at the world of interconnectivity. There are two types of standards in this area: vendor and user. De facto standards occur when a proprietary product becomes a standard based on the strength of the vendor's market position. IBM's Systems Network Architecture, or LU6.2, is an example.

Another type of vendor standard is one developed by a committee — for example, the International Standards Organization's Open Systems Interconnect (OSI) model. Much confusion has arisen about this standard, primarily because it is not yet complete.

For a number of years, OSI has been pegged as *the* emerging standard. While many observers predicted that large groups of users will rush to purchase products based on it, this has not been the case. This is primarily because of the incompleteness of the OSI standard and the fact that another internetworking scheme — Transmission Control Protocol/Internet Protocol (TCP/IP) — was already in place and working.

TCP/IP, a user standard, was originally developed in the 1970s by the federal government to address the need to connect dissimilar computers and networks.

The standard made its way into the scientific and university communities because it became a part of Unix. Recently, we have seen a dramatic increase in the number of TCP/IP users in the commercial sector, in which corporate users face the same need to link disparate networks. Although TCP/IP may be supplanted by OSI in the future, it is here and it works, hence its adoption.

Given the background information, we can consider how Apple is addressing interfacing with these interconnection standards. In the IBM world, after a number of false starts, Apple introduced MacAPPC. Slated to be available this summer, the product links Macintoshes through a Macintosh II gateway to other systems using IBM's Advanced Program-to-Program Communications (APPC).

Since MacAPPC was released in the form of a developer's tool kit, Apple is dependent on third-party developers to fulfill user needs through new products. So now the questions are, Will we see immediate products, and what types of products will they be?

The answer to the first question is that we will probably not see user products until next year. While APPC is a very important strategic protocol for IBM, there are very few workstation-based applications that currently take advantage of APPC. This is primarily because third-party software vendors do not understand how to take advantage of the capability for connecting to other systems in the peer-to-peer fashion that is provided by APPC.

In your community

The first place APPC-based applications are likely to appear is in the corporate community. Corporate programmers are becoming very active in the area of homegrown connectivity applications for personal computers.

Particularly as we move into the world of IBM and Microsoft's OS/2, corporate technicians are displaying a tremendous interest in writing their own applications. For the first time, these developers seem to feel there are adequate software platforms and tools to help them provide acceptable services to their users.

The first types of APPC-based solutions will be in the data base area. Developers will be taking advantage of connectivity capabilities to IBM mainframes in a cooperative processing fashion. This capability is especially important since more than 50% of corporate information is stored on IBM mainframes.

White is president and chief executive officer of Infonetics, Inc., a market research firm based in Santa Clara, Calif.

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NEW PRODUCTS

Local-area network hardware

An add-in board for personal computers that reportedly combines graphics capabilities with a port for a Apple Computer, Inc. Appletalk network has been developed by **Hercules Computer Technology, Inc.**

The monochrome **Network Card Plus** is said to allow users to network PCs, Apple Macintoshes and Sun Microsystems, Inc. Unix-based systems running Digital Equipment Corp.'s TOPS. The card includes all the standard graphic and text capabilities of the Hercules Graphic Card Plus and permits network sharing of laser printers and hard-disk storage devices.

Network Card Plus costs $369 and comes with a two-year warranty.

Hercules, 921 Parker St., Berkeley, Calif. 94710. 800-532-0600.

TCL, Inc. has announced a high-speed data networking package composed of the **Model 2012 Adapter Card** and **Model 3002 TCP-NET** software.

The package connects IBM Personal Computer, PC XT, AT and compatible systems to large computer networks running under Tranmission Control Protocol/Internet Protocol by way of 10M bit/sec. Ethernet and IEEE 802.3 local-area networks.

Operation with Ethernet Version 1 or 2 and 802.3 networks is user-selectable via a jumper. The adapter card is a single full-size card with 16K bytes of static random-access memory.

The Model 2012 Adapter Card costs $399. The Model 3002 TCP-NET software costs $400.

TCL, 47621 Westinghouse Drive, Fremont, Calif. 94539. 415-657-3800.

Local-area network software

Wordtech Systems, Inc. has begun shipping **Networker Plus**, its work group productivity tool for local-area networks.

The product offers distributed processing, task sending and message and screen transmission to IBM Netbios-compatible LAN users. Available in both memory-resident and batch mode, Networker Plus can also be built into Ashton-Tate Corp. Dbase applications by using Quicksilver, Wordtech's Ashton-Tate Dbase III Plus compiler.

The package requires an IBM PC-DOS 3.1 LAN with Netbios or Netbios emulation. Depending on individual application requirements, between 40K and 100K bytes of free memory are needed per workstation.

Networker Plus costs $295 per file server.

Wordtech, P.O. Box 1747, Orinda, Calif. 94563. 415-254-0900.

A local-area network version of Officewriter has been introduced by **Office Solutions, Inc.**

Officewriter/LAN 2.0 is said to provide printer support for laser and Adobe Systems, Inc. Postscript printers and will allow the user to customize library settings and format line print options. Document protection capabilities are also included. The product is compatible with 3Com Corp., Novell, Inc. and IBM LANs.

Officewriter/LAN 2.0 costs $995.

Office Solutions, 2802 Coho St., Madison, Wis. 53713. 608-274-5047.

Network management

Azure Technologies has added a **3270 Response Time Analyzer** to **Coaxscope**, its personal computer board and software combination for converting an IBM Personal Computer, PC XT, AT or compatible into a data scope for monitoring Type A coaxial protocols.

The Response Time Analyzer allows network response time statistics to be derived from the vendor's 3270-Coax link. The product was designed as a tool for developers, network managers and support personnel, particularly in multivendor environments.

The base price of Coaxscope is $2,995.

Azure Technologies, 38 Pond St., Franklin, Mass. 02038. 617-520-3800.

Modems/Multiplexers

Several high-speed modems and related products have recently been introduced by **Universal Data Systems, Inc.**

The **V.32 Data Pump** is a full-duplex, 9.6K bit/sec. OEM modem module that offers compatibility with CCITT V.32 and V.32 communication standards. The product is targeted at OEMs and systems integrators. The V.32 Data Pump costs $695 in single-unit quantities.

The **Sync-Up T9628B** is a combination 9.6K bit/sec. modem and protocol converter on a single IBM Personal Computer-compatible module. The modem transmits synchronous, half-duplex data at 9.6K bit/sec. over the public switched telephone network utilizing trellis coding. The Sync-Up T9628B costs from $1,540.

The **9648T** is a combination 9.6K and 4.8K bit/sec. modem that incorporates several data transmission standards and provides trellis-coded error protection. The 9648T costs $1,695.

Universal Data Systems, 5000 Bradford Drive, Huntsville, Ala. 35805. 205-721-8000.

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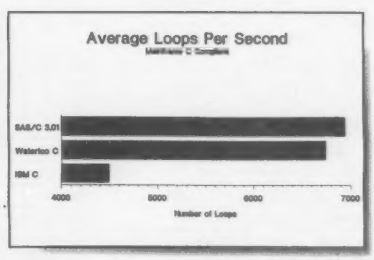

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Spotlight is a series of pullout sections within *Computerworld*, each focusing on one product category. With 24 Spotlight sections in 1988, you'll get the purchasing specifics you need for PCs, LANs, printers and productivity software — to name just a few. Each Spotlight contains quick reference specification charts that compare products on a feature-for-feature and dollar-for-dollar basis. Plus related editorial on real-life applications, interviews, vendor viewpoints and market trends. And since it's a pullout section, you'll be able to save and refer to this information as you need it.

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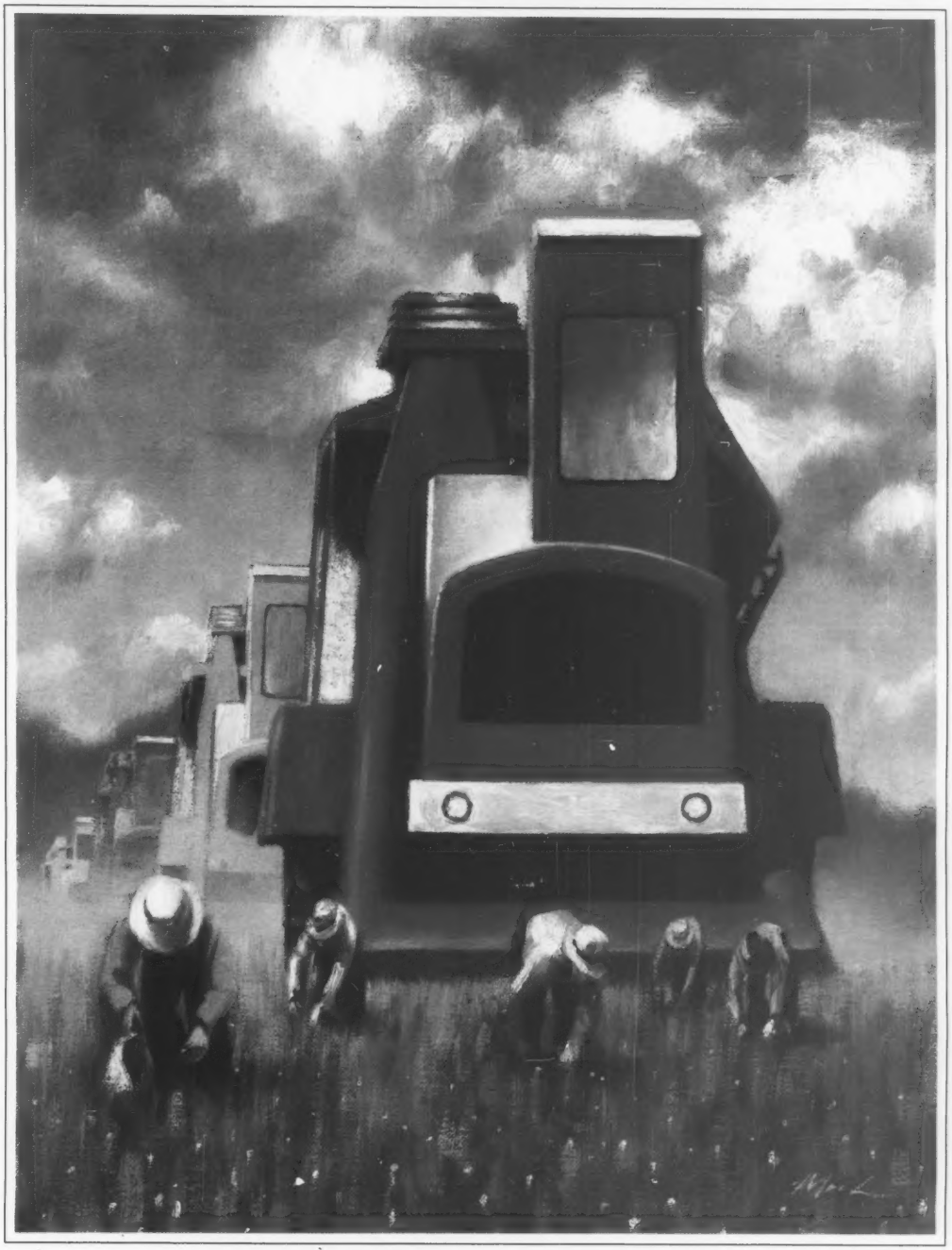

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CASE technology is perhaps the most profound change to ever hit the software community. CASE is the automation of automation. It offers a very practical answer to twenty-five-year-old software productivity problems. As for other forms of manufacturing, the best way to improve productivity and quality is through automation. CASE proves this is true for software tools.

CASE Tools and Techniques

CASE is a combination of techniques and tools aimed at building and maintaining software systems of all types - large and small, commercial and scientific, on-line and real-time embedded. CASE tools provide full coverage of the software life cycle by providing auto analysis, design, implementation and maintenance as well as project management of software systems. Many CASE tools include powerful graphics editors to improve the user interface and to transform software development into a visual process . With the use of workstations, PCs, local area networks and PC-based tools, for the first time the software developer can work from a highly responsive, dedicated development environment. Examples of CASE tools are diagramming tools, screen and report painters, code generators, documentation generators, restructuring and reverse-engineering tools. Different CASE tools focus on particular aspects of system development and different types of software systems including COBOL, Fortran, C, Ada, and embedded applications. CASE promotes new techniques like information engineering, rapid prototyping and JAD sessions with end users as well as supports traditional structured techniques like structured design. CASE tools make structured techniques practical to use by automating structured diagramming and documentation production.

CASE Changes to Software Development and Maintenance

CASE changes and improves the software life cycle. With CASE, the system developer can focus more on analysis and design and less on coding and testing. Manual program coding is replaced by code generators that automatically produce code from design specifications. Design specifications take the form of structured diagrams (like data flow diagrams and entity relationship diagrams) and prototype models. As the specifications are entered into the CASE repository, they are automatically checked for correctness and cross-referenced with other system information. All system information is stored in the CASE repository where it can be automatically managed and shared.

With the aid of CASE tools, rapid prototyping replaces paper-based methods for defining system requirements. And, CASE greatly reduces the software testing effort. Automatic analysis and checking of the design specification eliminates many errors arising from inconsistent and incomplete specifications. Automatic code generators eliminate errors arising from the misuse of programming languages. Finally, CASE addresses serious and costly software maintenance problems with CASE tools that automatically document, analyze, and restructure existing software programs.

Major CASE Technology Issues

A couple of years ago, hardly any software developer had heard the term CASE. Now it is the center of attention - the latest and greatest answer to software problems. The CASE tools market has one of the highest growth rates of any segment of the computer industry. As the market grows, the definition of CASE and the impact of CASE issues continue to change. In 1988, the following are the major issues that must be addressed to make CASE work and really deliver software productivity and quality improvements in practice.

- CASE tool integration for full life cycle support
- Standards for CASE tool interfaces and connectivity
- Structured methodologies support
- CASE support for project management
- CASE support for existing systems
- CASE repository architectures

Why Attend the CASE Symposium?

All this rapid growth has brought excitement and hope but also confusion for CASE users. What is the CASE technology? What are CASE tools? How can CASE be successfully implemented in any organization? What are the current CASE issues and trends. Find out by attending the CASE Symposium. It is the first and the best attended conference on CASE. The CASE Symposium (CASES) will define the key concepts and terminology of Computer-Aided Software Engineering and discuss the current CASE issues. In three intensive days, you will be able to evaluate, compare and contrast various CASE approaches and learn how to incorporate this new technology into your organization.

Day One Seminar Outline

1. Overview of Computer-Aided Software Engineering (CASE)

2. CASE Technology
   a. What is CASE technology?
   b. Automation of automation
   c. Automation of software life cycle
   d. Linking design automation and program automation
   e. Total solution to software crisis
   f. Evolution of CASE technology
   g. Current CASE issues

3. Characteristics of CASE Systems
   a. New software development environment
   b. Graphic design capabilities
   c. Central information repository
   d. Tightly integrated tool sets
   e. Full life cycle coverage
   f. Prototyping support
   g. Automatic code generation
   h. Automatic correctness and consistency checking

i. Key CASE system concepts
j. CASE system comparison criteria

4. **Review of Vendor Products: A discussion of how to categorize CASE products**
   a. CASE toolkits
   b. CASE workbenches
   c. CASE methodology companions
   d. Review of CASE market, major vendor players and growth predictions

5. **CASE Hardware Platforms**
   a. PC workstations
   b. Mainframe
   c. PC-mainframe link
   d. One, two, and three tiered architectures

6. **Changes to the Software Life Cycle**
   a. Front end loading
   b. Object-oriented program design
   c. Minimizing manual implementation tasks
   d. Rapid iterative prototyping
   e. Minimizing the need for testing
   f. Merging development and maintenance strategies

7. **CASE Productivity Benefits**
   a. Increasing productivity by a factor of 20
   b. Getting more from each developer
   c. Reducing the change and maintenance effort
   d. Case studies on CASE
   e. Short/long term benefits
   f. Ways to implement CASE

8. **Related Technologies**
   a. CASE's dominant role
   b. Software reusability as a development methodology
   c. Role of COBOL
   d. Absorption on fourth generation
   e. Incorporation of fifth generation technologies
   f. Emerging issues

9. **Future Trends**
   a. Habitable environment
   b. Intelligent training systems
   c. Intelligent methodology drivers
   d. Software reusability

Symposium Chairman

McClure

DR. CARMA MCCLURE, internationally known author and lecturer, will lead the CASE Symposium overview. Dr. McClure specializes in software methodologies, software law and project management. She is a leading authority on CASE technologies. Her lectures and workings on the subject have reached thousands of software managers and developers worldwide. Since 1974, she has served as a software consultant and has worked with major corporations including Blue Cross/Blue Shield, GTE, Bell Labs, Diebold, TI, DEC, and DuPont. Dr. McClure is a software engineer and has taught software engineering courses at Illinois Institute of Technology (IIT) and Northwestern University. She has served as a National ACM Lecturer and has conducted seminars on software maintenance, structured techniques and project management. Her publishing credits include numerous articles on software and seven books, including four coauthored with James Martin. Her latest book, *CASE is Software Automation*, from Prentice-Hall, is the most comprehensive book on the subject of CASE.

Special Presentation: CASE Products for Real-Time Developers

Although most CASE products support the development of business systems, a substantial and growing number of vendors are also providing for the special needs of real-time developers. Real-time CASE products provide features such as graphic notations to represent timing and synchronization requirements, model execution to analyze time-dependent behavior, and support for DoD 2167 documentation and tracing requirements. A number of the leading real-time CASE vendors will be demonstrating their products at CASES and there is a special educational track for real-time developers as part of the day 1 format.

Special Presentation: Real-Time Seminar by Dr. Paul T. Ward

Ward

Seminar Outline
Concurrent Afternoon Session

1. Vendor Survey: Who are the scientific/engineering CASE tool vendors?
2. Modeling Paradigms by Vendor
3. Life Cycle Coverage by Vendor
4. Depth of Model Analysis by Vendor
5. Code Generation Capabilities by Vendor
6. Project Management/Documentation Support by Vendor
7. Common Work Environment Support by Vendor
8. Delivery Platform by Vendor
9. Product Development Trajectory by Vendor

Dr. Paul T. Ward is President of Software Development Concept and a leading software development consultant, specializing in requirements specification, high-level software design, training of development personnel, and methodology definition of real-time systems development projects. He has experience in systems development in both real-time and business environments. Prior to opening his own consultancy, Mr. Ward was with Yourdon.

PRODUCT PRESENTERS

ADPAC COMPUTING LANGUAGES CORP.

Adpac Computing Languages Corporation develops, markets and services technology support tools for the IBM mainframe operating under MVS. Adpac's CASE tools (DFDP and DESIGN) provide a front-end CAD/CAM diagramming technique that assists analysts in drawing any type of diagram and design analysis with the capability to verify the contents of diagrams.

AGS MANAGEMENT SYSTEMS, INC.

AGS/MS is recognized as the world's leader in systems development methodologies and project management systems. MULTI/CAM, the micro-mainframe CASE system created by AGS/MS, integrates software development tools, software design and production models, project management and any other user selected CASE tools into a unified, automated work environment.

AMERICAN MANAGEMENT SYSTEMS

AMS is a major computer services firm specializing in applications development. AMS's Life cycle Productivity System (LPS) integrates productivity tools from AMS and other vendors for strategic system planning, design, development, maintenance, and project management. LPS produces all deliverable work products required by most methodologies. Major portions of LPS operate on PCs. Implementation, configuration control, and foundation software modules operate on IBM mainframes.

ANALYSTS INTERNATIONAL CORP.

Analysts International Corporation, a professional data processing software and services company, and a leader in the computer industry for over 22 years, introduces CORVET. CORVET is a graphics oriented, PC based, interactive CASE design and development product that generates stand-alone COBOL programs and comprehensive documentation for IBM mainframe environments.

ARTHUR ANDERSEN & CO.

FOUNDATION is a computer-integrated environment for software engineering developed by Arthur Andersen's consulting practice. Covering the entire systems development life cycle, FOUNDATION consists of METHOD/1, an automated systems methodology, DESIGN/1, a PC LAN-based tool for planning and design, and INSTALL/1, an IBM mainframe-based environment for implementation and support of DB2 applications.

ARTHUR YOUNG & CO.

Arthur Young is an international accounting, tax and management consulting firm which is working with KnowledgeWare to develop the Information Engineering Workbench (AY/IEW), and markets KnowledgeWare products internationally and uses the AY/IEW for systems building. Arthur Young will present its experience building systems using the AY/IEW and Information Engineering techniques.

ASYST TECHNOLOGIES, INC.

The DEVELOPER provides a generic, multi-user, automated support for the systems development process, through its repository located either at the PC, at the mainframe (using DB2) or at both sites. The DEVELOPER and its CUSTOMIZER module allow the use of any methodology at all desired levels of compliance and rigor. Repository integrity is maintained through a menu-driven SQL query language and built-in ASYSTants capabilities.

BACHMAN INFORMATION SYSTEMS, INC.

Bachman Information Systems, Inc. is exhibiting a new CASE system, The Bachman Product Set which supports the development of new applications while supporting existing applications. It provides the powerful maintenance, enhancement and migration capabilities MIS departments need to control the largest component of their workload.

CATALYST

CATALYST, an information technology firm of Peat Marwick, will present PATHVU, RETROFIT, ReACT, and DataTEC. PATHVU provides analysis and detailed reporting of program logic and structure. RETROFIT restructures COBOL code. ReACT translates Assembler programs to structured COBOL. DataTEC provides data element analysis, standardization and migration capabilities. These products make up the reengineering baseline necessary to migrate existing systems to advanced technical environments.

CGI SYSTEMS, INC.

PACBASE is a full-cycle CASE product. It integrates: Mainframe and PC based analysis and design workstations for the development and maintenance of application specifications. This is done through active prototypes, a centralized enterprise-wide dictionary that controls and manages all business specifications directly into complete COBOL applications, including all code and documentation.

CHEN & ASSOCIATES, INC.

Chen & Associates provides products, training, and consulting in data-oriented system development. Products (PC-based) to be presented are: ER-Designer, which defines your information requirements in entity-relationship diagrams; SCHEMAGEN, which generates schemas for your database systems (from micro-based to mainframe based); Normalizer, which normalizes data or words.

COMPUTER SCIENCES CORP.

The Technology Activity's Design Generator is an object-oriented, expert system that automatically selects a central transform from a data flow diagram and generates an initial design represented in structure chart notation. The graphic-intensive user interface features intelligent pop-up menus and multi-pane browsers.

CORTEX CORP.

CorVision is an application development system that automates the entire software development cycle for the DEC VAX/VMS environment using a technique called Picture Programming. Picture Programming allows DP professionals to visualize an application by diagramming the design and then automatically generating a production-ready application directly from the pictures.

DIGITAL EQUIPMENT CORPORATION

As a leading computer manufacturer, Digital provides a range of integrated Application Development tools for solutions to business and engineering problems. The unique offerings are workstation based and address all aspects of the Applications Development Life Cycle. They are integrated into the VAX hardware, software and network architecture to provide enterprise wide solutions.

HOLLAND SYSTEMS CORP./DELOITTE HASKINS AND SELLS

Deloitte Haskins & Sells and Holland Systems Corp. have pooled their proven consulting and software product expertise in the IRM area. The result is a line of products that address the entire information resource management process...from business modeling...to database design and analysis...to application development and implementation. The companies will feature the 4Front family of IRM products.

I-LOGIX, INC.

i-Logix, Inc. pioneers system design automation with STATEMATE, the only available tool that models the dynamic behavior of real-time systems as well as system functions and architecture. With STATEMATE, users produce a specification that is compiled allowing its execution to be viewed on screen. STATEMATE includes three graphic languages for modelling; execution and simulation capability; rapid prototyping in Ada; and 2167A documentation.

INDEX TECHNOLOGY

Index Technology markets the Excelerator family of products that automate systems development. Products include PC Prism for systems planning, Excelerator and Excelerator/RTS for analysis and design, plus links to application generators and programming environments. Excelerator and Excelerator/RTS support a variety of techniques and methodologies and can be tailored for each organization's needs.

INFODYNE INTERNATIONAL, INC

InfoDyne, Inc. markets and distributes MASTER, a PC based CASE tool and methodology, based on the E-R (Entity-Relationship) approach to systems planning and design. MAST-ER accommodates numerous approaches to the problem of analysis, design and documentation of all design activities relating to the conceptual, logical and physical model of data and international processes in an information system.

INFOREM PLC

Inforem's Professional Application Generation Environment (PAGE) is a unique CASE offering. A multi-user product, it combines on-screen graphics with a systems encyclopedia and uses a relational database on networked PCs. PAGE is based on the Inforem Method which provides a seamless transition right from analysis to program code both for PC and mainframe systems.

INTEGRATED SYSTEMS, INC.

AutoCode focuses on the needs of Real-Time Software Engineers and addresses all steps from analysis to design, simulation and code generation. The graphical specification environment features engineering block-diagrams, data flow/-control flow, state transition, and process descriptions. Ward-Mellor real-time software methodology with Boeing-Hatley extensions are included in an environment where simulation and analysis can be performed for design verification; and real-time code in C, Ada or Fortran can be generated automatically.

INTERACTIVE DEVELOPMENT ENVIRONMENT (IDE)

IDE's product, Software through Pictures, is a set of integrated graphical editors and error-checking tools supporting structured analysis and design methods. The editors are linked to a Data Dic-

PRODUCT PRESENTERS

tionary supporting definition of names, types, constants and associated text. Users can generate Ada declarations and define process and module templates to generate specifications.

JAMES MARTIN ASSOCIATES

James Martin Associates, an international consulting firm established by James Martin in 1981, is considered the world leader in creating improved systems development methods and CASE tools to support those methods. With more than 250 professionals throughout the world. JMA's teams provide commercial and government clients with technical and management services.

KNOWLEDGEWARE, INC.

Knowledgeware, Inc. provides a complete Integrated Computer-Aided Software Engineering (I-CASE) environment for the planning, analysis, design, construction, and maintenance of computer-based information systems. The Information Engineering Workbench (IEW) provides enterprise modeling, data modeling, process modeling, systems design, and code generation experts. The "Knowledge Coordinator/Encyclopedia" team uses state-of-the-art artificial intelligence technology.

LANGUAGE TECHNOLOGY

Language Technology provides CASE products to the IBM mainframe market. The company's flagship product, RECODER is the leading COBOL structuring tool. RECODER automatically transforms difficult to maintain, unstructured COBOL into structured COBOL in minutes. Language Technology's INSPECTOR is the only quality assurance tool based on scientific measurement of COBOL quality and maintainability.

LBMS-LEARMONTH & BURCHETT MANAGEMENT SYSTEMS, INC.

LBMS will present its PC-based tools, SUPER-MATE and AUTO-MATE PLUS. SUPER-MATE provides a powerful set of automated facilities for strategic planning, including business area/activity analysis, analysis of competitive strategies, the prioritization of applications, and the development of the strategic plan. Results of this plan may be passed to AUTO-MATE PLUS which provides full support for systems analysis, logical design and automatic generation of physical designs and data dictionary syntax for ADABAS, DB2, and other DBMS.

MANAGER SOFTWARE PRODUCTS (MSP)

The MANAGER Family of Products (PC and Mainframe) is dedicated to automating all phases of the systems life cycle, from strategic information planning to the generation of enabled code. MSP will present managerVIEW, the intelligent workstation based graphical information engineering tool driven by the central knowledge base resident on the corporate dictionary. ManagerVIEW is integrated with the mainframe corporate dictionary and also runs on the IBM PC family and PS/2.

McDONNELL DOUGLAS, ISG

McDonnell Douglas Information Systems Group is focused on providing single-source solutions representing a tailored framework for software engineering. ProKit WORKBENCH is a new IBM PC-based information system that automates the application of proven structured techniques to the strategic planning, analysis, and design phases of the system life cycle.

MICHAEL JACKSON SYSTEMS, LTD.

Jackson CASE tools automate the widely acclaimed Michael Jackson methods of system development and program design. SPEED-BUILDER supports the analysis phases of development through powerful graphical and text facilities and automates documentation production. The cooperating Program Development Facility (PDF) generates complete, well-structured program code from Jackson structure charts.

MICRO FOCUS

Micro Focus COBOL/2 Workbench puts a mainframe programming and testing environment on a PC platform under MS-DOS or OS/2. It is used by developers of COBOL, CICS DL/I, and IMS DB/DC applications to improve productivity and cut applications development backlogs. Micro Focus COBOL compilers and CASE tools are the choice of IBM, AT&T, Sun Microsystems, Microsoft, and other industry leaders.

NASTEC CORP.

Nastec Corporation develops tools for commercial, government, and engineering software developers. CASE 2000 DesignAid is based upon an interactive, multi-user database with features for process modeling, real- time system modeling and documentation. Operating in the IBM PC and Digital VAX environment, CASE 2000 also includes tools for requirements management, project management and control, and consulting and training in CASE technology.

NETRON INC.

The NETRON/CAP Development Center is a CASE system for building custom, portable COBOL software using a frame-based software engineering process called Bassett Frame Technology. NETRON/CAP unifies the prototyping/development/maintenance life cycle into an automated specification procedure. The open design architecture allows unlimited automation of additional application functionality for IBM mainframes and PCs, VAX systems and Wang VS minis.

OPTIMA, INC. (Formerly known as Ken Orr & Associates)

Optima, Inc. integrates the use of tools and technology with the experience of people. DSSD, (Data Structured Systems Development) the flagship product, is a lifecycle methodology which serves as the base of the product offering. CASE tool products which automate the methodology are Brackets, for the diagramming process, and DesignMachine, for requirements definition and logical data base design.

ON-LINE SOFTWARE INTERNATIONAL

On-Line Software International presents CasePac-Automated Software Development with a powerful DB2 data dictionary. As the foundation for On-Line Software's CASE platform, CasePac provides a complete, fully active central repository, software engineering facilities including a graphics front end, change management and maintenance facilities.

PANSOPHIC SYSTEMS, INC.

Pansophic Systems, Inc. presents TELON. The TELON application development system captures design specifications to generate COBOL or DL/I applications. TELON assists the transition from analysis to design by providing interfaces to leading front end analysis tools. TELON components include: directory, data administration, screen/report painters, prototyping, specification facilities, automated documentation, generator, and test facility.

POLYTRON CORP.

POLYTRON offers the leading configuration management system for MS/DOSPC and VAX/VMS software development. PVCS maintains versions and revisions of software systems. PolyMake automatically rebuilds any desired version of the system. PolyLibrarian maintains libraries of reusable object modules. The tools work together or independently with ANY language and your existing tools.

POPKIN SOFTWARE & SYSTEMS INC.

Popkin Software & Systems offers SYSTEM ARCHITECT, a PC based CASE tool running under Microsoft Windows. Its comprehensive set of process and data driven methodologies for structured analysis and design include DeMarco/Yourdon, Ganes and Sarson, Ward & Mellor (real-time), structure charts, and entity-relationship diagrams. SYSTEM ARCHITECT's Data Dictionary-Encyclopedia utilizes dBase III file format.

READY SYSTEMS

Ready Systems will present CARDTools, which supports automatic DoD 2167 documentation generation, specific Ada requirements, including object oriented design, packages, information hiding and rendezvous. CARDTools offers real-time performance deadline analysis on multi-tasking architectures, and hardware/software interface specification, including intertasking synchronization and communication designs, allowing for design analysis verification prior to actual implementation.

SAGE SOFTWARE, INC.

Sage Software, Inc. develops, markets, and supports a family of CASE tools for developers of IBM-based information systems. The company's product family (known as the APS Development Center) encompasses the software development cycle and supports the physical design, interactive prototyping, coding, testing, and maintenance of COBOL-based applications software.

SOFTLAB, INC.

Softlab, Inc., will present MAESTRO, the integrated Software Engineering Environment. MAESTRO organizes and manages the software cycle through real-time project management, time accounting, and your unique standards. MAESTRO integrates customizable tools for design; coding, testing, documentation, and maintenance, is language independent, and fits in numerous hardware and software environments.

TEKTRONIX

TekCASE is a family of automated software development tools that help software engineers and project managers analyze, design, document, manage, and maintain complex real-time systems. Because they support Digital's complete VAX line and integrate with VAXset - software, TekCASE products are flexible, extensible, and especially well-suited for large projects.

All presenters may not be present in all cities.

PRODUCT PRESENTERS

TEXAS INSTRUMENTS

Texas Instruments' integrated CASE product, The Information Engineering Facility, is designed to automate the complete systems development life-cycle. It consists of a powerful mainframe encyclopedia and PC-based, graphical toolsets to support analysis and design. TI can demonstrate today the major components of this product including: strategic planning, analysis, design, COBOL code generation, and database generation.

THE CADWARE GROUP, LTD.

The CADWARE Group, Ltd. designs, produces and markets rule-based frameworks and modeling tools for development of complex systems. Managers, planners, systems analysts, and designers use these tools to help manage the complexity of defining and evaluating mission-critical business, industrial, and technical systems.

TRANSFORM LOGIC CORP.

Transform addresses the development and maintenance of the entire application life cycle. Using expert system technology, complete COBOL applications are produced for IBM mainframe DBMS's DL/I and DB2. The concepts behind automated development, data driven design architecture, prototyping and maintenance are reviewed with examples of user accomplishments.

VISUAL SOFTWARE, INC.

Visual Software, Inc. markets personal CASE tools for workstation, LAN and mainframe design environments. The base package, vsDesigner, is a methodology-independent workbench supporting shared access to LAN-based information repositories. Several default design syntaxes come with the product, including those for real-time design. Extensive analyses are supported and an optional SQL interface to the design data is available.

YOURDON INC.

The YOURDON Analyst/Designer Toolkit supports both the traditional and real time YOURDON Techniques and allows for the creation of all the diagrams associated with the techniques. The diagramming facilities of the Toolkit are integrated with a powerful project dictionary which features dBase III compatibility. The Toolkit provides error checking to insure the accuracy of diagrams and dictionary entries.

Faculty

Low Impact Implementation Strategies for High Impact Corporate Development Centers by Kevin J. Burns

Burns

Kevin Burns is the President and Chief Executive Officer of Sage Software, Inc., a leading developer and marketer of application development tools for developers using IBM systems. Under his leadership, Sage Software has successfully introduced more than a dozen integrated application development products in its APS Development Center product family. Burns is an authority on application generation technologies, methodologies and implementation strategies.

TOPICS

- The critical success factors required by MIS executives to reduce growing application backlogs
- The generic architecture for the ideal development center - an environment constructed with SAA-based building blocks
- Implementing "best-in-class" products within this SAA environment
- A three-phased implementation plan to transition into the ideal development environment
- How a proven evolutionary approach to building information systems can provide revolutionary productivity results

Technical Services Organization by Glover T. Ferguson, Jr.

Ferguson

Mr. Ferguson is the Director of Development for Arthur Andersen's FOUNDATION product line which provides dictionary integrated CASE support for the complete life cycle of commercial transaction processing applications. Mr. Ferguson has extensive experience in technical architectures and systems engineering serving a broad range of industries. Mr. Ferguson has published articles in *ComputerWorld's In Depth, Infosystems* and *Modern Office Technology*. He is a frequent speaker at conferences and symposia.

TOPICS

- "More Than A Case"
- Before the acronym CASE
- The activities CASE seeks to support
- Current status of CASE in the marketplace
- The future of CASE, 1-3 years
- Arthur Andersen's experience with users and user acceptance

The Impact of Expert System Technology On CASE by Chris Gane

Gane

Chris Gane is President of Rapid System Development, Inc. and co-author of *Structured Systems Analysis: Tools and Techniques* (Prentice-Hall 1979). He has written several other books on system development (most recently *Computer-Aided Software Engineering: The Methodologies, the Products, the Future*, published by Rapid System Development Inc.). He is also Principal Consultant at Bachman Information Systems, working on the development of expert assistant products for systems analysis and design.

TOPICS

- How much expertise can be built into automated aids? Problems of definability, size of knowledge-base, and computing feasibility
- Support in relating business objectives to system objectives
- Real-time suggestions for syntax improvement
- Reverse engineering of source code to logical model
- Forward engineering of database design and code from logical model
- Parsing of natural language requirements statements

Choosing Your CASE Tool: A User's Viewpoint by Derek J. Hatley

Hatley

Derek J. Hatley is a Principal Staff Engineer at Smiths Industries, SLI Avionics Systems Corporation, where he is responsible for all system and software requirements and design methods and tools. He developed the Real-Time Requirements Specification (RTRS) method described in the book *Strategies for Real-Time System Specification*, which he co-authored. He managed the first major application of this method to Flight Management Computer System for the Boeing 737-300.

TOPICS

- CASE tool evaluation experience
- Process, methods, and tools
- Required characteristics of

CASE tools
- Criteria for real-time requirements specification
- Application of the criteria

The Costs and Value of CASE: A Survey of the State of the Art by Capers Jones

Jones

Mr. Jones is Chairman and cofounder of Software Productivity Research, Inc. In addition to developing the line of SPQR estimating models, he is an international private consultant, speaker, seminar leader and author. One of his previous publications for the IEEE, *Programming Productivity: Issues for the Eighties*, remains one of their ten best sellers. He is also author of *Programming Productivity* in McGraw Hill's Software Engineering Series.

TOPICS

- Optimal CASE work stations; on-line documentation
- The CASE management environment
- The CASE technical environment
- Support for reusable designs (blueprints) and reusable code
- Platform tools for handling communication, data base security, and revision control
- Major changes required in the physical and social software environments

CASE For Large Scale Systems In Aerospace, Defense and Engineering by Dr. John Manley

Manley

Dr. Manley is Professor and Director of the Manufacturing Systems Engineering Program at the University of Pittsburgh. He has worked extensively for the DoD in the past, has been an industry executive, and is currently advising NASA's Jet Propulsion Laboratory in the area of engineering large-scale space information systems. His research and consulting interests include the issues and opportunities faced by both buyers and developers of large-scale computing systems.

TOPICS

- Large scale systems - history and future trends
- Complexity and control issues
- Specific CASE related problems
- Some solutions to large-scale problems
- Large scale system CASE opportunities

Multi-Person Projects & CASE by Byron D. Miller

Miller

Mr. Miller is Director of Product Planning for KnowledgeWare, responsible for product architecture and specifications. Prior to joining KnowledgeWare, Mr. Miller worked for E.I. duPont Textile Fibers Division where he served as Architect and Manager for the development of an internal product that was similar in concept, although limited in scope, to a component of KnowledgeWare's products.

TOPICS

- Reviewing past requirements
- Working together - method follows task
- Transaction processing - one strategy that doesn't work
- Cooperating experts - closer to the truth
- Tool support today, tomorrow

Computer-Aided Software Engineering - CASE by Ken Orr

Orr

Ken Orr, Chairman and Chief Scientist, is the founder of Optima. One of the principal developers of the DSSD methodology, he directs the company's research activities. Orr is recognized internationally as a leader in the systems technology "structured revolution," and has held key positions in government administration, management consulting and software development. Orr is a frequent speaker at international conferences and seminars.

TOPICS

- Automating the systems development process
- Matching methods and CASE tools to systems classes
- Experiences with CASE technology
- How do we manage CASE?
- What can CASE learn from other industries (CAD/CAM/CIM)?
- People are the key to CASE

Your CASE Tool and Information Engineering by Ronald G. Ross

Ross

Ronald G. Ross is the editor of the *Data Base Newsletter*, and the founder of Ronald G. Ross Associates. He is one of the world's leading researchers and commentators on data management topics and his books and his monograph on IBM's IMS have been read by thousands of data management professionals worldwide. His newest book, just published, is entitled *Entity Modeling: Techniques and Application*, and covers the ER approach in detail.

TOPICS

- What support does the data driven approach require in your CASE tool?
- The CASE tool and strategic planning
- The CASE tool and analysis
- Why entity - modelling?
- What does the data driven approach suggest for the architecture of your CASE tool?
- The dictionary components
- The integration issue
- Rule based development and behavior modelling

Hotel Information

- Washington, D.C., September 12-14
  Crystal Gateway Marriott
  (703) 920-3230

- Chicago, October 12-14
  Marriott's Lincolnshire Resort
  (312) 634-0100

- San Francisco, November 29-December 1
  Hyatt Regency, Oakland
  (415) 893-1234

CASES: The Computer-Aided Software Engineering Symposium

Two Ways To Register: **1.** Call (617) 470-3880 between 9:00 a.m. and 5:00 p.m. Eastern Time.
2. Fill out and mail in the form below (including mailing label) to: DCI, 6 Windsor Street, Andover, MA 01810.

Registration Fees

Individual Fee, Entire 3 Days	$895
Second	$695
Third	$495
Fourth Registration	FREE
Fifth Registration and Over	$495
Individual Fee, Day One Seminar Only	$450

Discount policy applies to attendees registering from the same company at the same time.

Group Attendance

Previous attendees have told us that the best way for companies to gain the most benefit from the program is to send two or more attendees. Our discount structure is designed to encourage multiple registrations from the same company. Have you considered sending representatives from different departments, divisions, or locations within your organization?

On-Site Seminars

We can bring many of our seminars on-site to your company. Our on-site seminars are one of the most cost-effective ways to update your mangers and professionals about the leading software technologies.

Reservations

A limited block of rooms at a special rate is being held at the hotel until three weeks prior to the symposium. Room registrations and hotel charges are the responsibility of the individual participant. Please register early.

Cancellation Policy

Cancellations received two weeks or more prior to the Symposium will be accepted subject to a cancellation service charge of $100. Transfers to a different Symposium date or substitutions will be accepted with no cancellation service charge as long as the fee is paid and the request is received before the date of the original Symposium. Registrants whose cancellation requests are not received two weeks prior to the Symposium (or no shows) are liable for the entire fee.

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A new generation of tools may make good on the promises of predecessors and free MIS from some pressure to produce

SECOND CHANCE FOR ESCAPE?

BY GORDON SHIELDS

JACQUELINE CHWAST

Being an MIS manager is like living in a fishbowl. You're always on display for people to look at, people never quite understand what it is you do, and every once in a while they give you a new toy, hoping it will improve your disposition. But nothing really does, because each day the fishbowl seems to get shallower as pressure to improve productivity and cut the development backlog is applied more insistently.

Something is on the way that does promise some relief, however. Coincidental with these growing pressures is the resurgence of computer-aided software engineering (CASE) technology. This second generation of CASE promises to alleviate some of the pressure by increasing developer productivity and reducing the maintenance effort.

CASE technology is not a new phenomenon; it has been around for more than four years. When first introduced in 1984, CASE was billed as a technology that would revolutionize the systems development process. It was supposed to shorten development time, increase effectiveness and change the approach to systems development from a back-room process to a user-driven one. While it did accomplish some of these things, most of the claims were premature.

Now, with the appearance of second-generation CASE technology, proponents are once again predicting a revolution. This time, the promises are even grander, as vendors of CASE technology attempt to deliver a product that can be used throughout the entire systems development life cycle, including automatic code generation. While the reality may again fall short of these claims, CASE has shown itself capable of generating something tangible. MIS managers are cautiously re-examining the technology with the belief that they can sell the concept and benefits to senior management.

To understand the advance that second-generation CASE represents and the impact it will have on the MIS department, it is important to review first-generation CASE and the experiences of using it during the past four years.

Shields is a senior consultant with Touche-Ross Consulting in Toronto.

Far, but not far enough

First-generation CASE was a major innovation. It was the first technology designed to address analyst and designer productivity. Its major fault is probably that it did not go far enough.

First-generation CASE was designed to assist systems analysts and designers in increasing productivity, improve the quality of software products and achieve greater management control over the development process. It usually consisted of a combination of personal computer-based hardware and software that captured analysis and design information, allowing users to create diagrams to describe systems and prepare documentation. It was sometimes appropriately referred to as an "analyst and designer workbench," reflecting its focus on the functional specifications and design steps.

One thing it did not do is substantially change the traditional systems development process. Most organizations today still adhere to some variation of the traditional approach to systems

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development. This methodology evolved in the late 1960s and was designed when the mainframe was considered state of the art and the process was strictly manual. It was updated in the 1970s, with the addition of structured techniques to minimize laxity and increase the discipline of systems development.

Linear view

According to this approach, a decision is made to design and implement an application, and then the user's requirements are defined in a user-needs statement and transformed into functional specifications. The application is then broken down into more detail, using techniques such as data flow diagrams.

The actual design of the system and how it is to be implemented is then created using a design technique, such as structure diagrams. The functions to be performed at each juncture of the structure diagram are broken down into detailed "minispecs," which are written in English. Programmers subsequently convert the minispecs and structure diagrams into program code.

This development process is not integrated and requires that specifications for the system be drawn up at least five times, using different techniques and languages. Very little checking is done for consistency and completeness of design, given the impracticality of performing these functions manually. In addition, approximately 65% of the total project effort is allocated to coding and testing. As a result, errors can be detected only after the system has been constructed, at which time it is very expensive to fix them.

The other major drawback of this approach is that program code must be constructed by hand. A recent survey of program code reported 10 to 50 errors per 1,000 lines of code.

Although this linear approach to systems development is inefficient, it continues to be the method for building systems in most MIS departments across North America.

> FIRST-generation CASE addressed only a portion of the systems development life cycle.

First-generation CASE addressed some of these inefficiencies by offering functionality to assist the analyst and designer. It allowed time in analysis and design for more iterations and user input. It also required strict adherence to structured techniques and top-down design, forcing analysts and designers to abandon the approach of building systems by osmosis.

But the inescapable fact is that the first generation addressed only a portion of the systems development life cycle and offered little integration of the steps of the traditional approach. These products confined themselves to analysis and design and ignored the remaining steps, such as project management and construction. Furthermore, while the tools provided tremendous assistance for tasks such as diagramming, they were limited in other areas, such as data dictionaries and integration with other development aids.

Even in those areas that it did address, there were several key weaknesses, including the following:

- Limited capacity of the diagrams and the data dictionary.
- Lack of support for multiple users.
- Cumbersome integration of data dictionaries.
- Lack of integration with other tools used by the MIS department.
- The user's lack of control over the appearance of the output, sometimes resulting in cluttered diagrams and charts.

Lucky seven

First-generation CASE consisted of seven components. The main component was the data dictionary, the central repository of data from which all other components fed. It was similar to a data base, in that all data was defined once and made accessible to all other components.

The graphics component was typically the most advanced aspect of the tool and supported various analysis and design techniques, such as Gane & Sarson data flow diagrams and Chen entity-relationship data models.

The report definition component allowed users to specify report design, using data elements defined in the data dictionary. Essentially a word processor, this component allowed the analyst to retrieve data element definitions from the data dictionary and position them on the report.

The dictionary reporter allowed analysts and designers to extract and report information from the data dictionary. It included a query language permitting flexible Search and Format commands.

The quality assurance component detected inconsistencies in the analysis and design specification and identified areas where information was missing.

The specification component was a word processor that provided a free-form slate on which the minispecs were created. Analysts used this component to describe the actions of processes and the contents of data files. With some products, it was also possible to simulate execution so that users could better understand how the end result would appear and operate.

There have been areas in which first-generation CASE has had a positive impact on the systems development process.

These products permitted developers to spend more time thinking about system design and validating their interpretation with users and less time performing mechanics, such as drawing data flow diagrams.

Team members could also

Continued on next page

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There's a time to buy and a time to wait

BY AMY SOMMERFELD FIORE

When should you seriously start investigating computer-aided software engineering (CASE) products? When is your company ready to take that step? And are CASE products ready for you?

Some CASE customers offer the following suggestions for when a purchase decision is appropriate:

- **When a specific product can help you on a specific project.** Don Hann at San Diego Gas & Electric Co. pushed his firm to buy Prokit Analyst from McDonnell Douglas Information Systems Group when he was gearing up to create a new system, Automated Distribution Operations System. Being a prospective user, he was named project engineer.

San Diego Gas's Hann

"When I got involved in the project and had to do data flow diagrams, the first thing I asked was, 'How can I do some of this on the computer?' " Hann says.

Prokit Analyst automates data flow diagrams and ties them to a data dictionary. "We had been spending two or three weeks on a PC, setting up a Lotus spreadsheet to list all the data elements," Hann explains. "Prokit gave me a printout in a few minutes."

- **When your company has a heavy growth period.** "Because we've grown so much and have more employees, there's a certain loss of control" over the in-house methodology, says Hank Childers, manager of advanced software engineering at Cytrol Portable Data Corp. in Edina, Minn. "It doesn't work to do things informally when the group is that size."

Scott's Timchal

Cytrol has a technical staff of 135 that develops custom software for financial services companies, primarily brokerages. "It seemed to me that CASE tools were defining some common set of engineering standards," Childers says. "It's not that the techniques were completely different than what we were doing, but they were more formal. So I thought, 'Why aren't we doing things like that across the board?' "

Cytrol acquired both a methodology, called Stradis, and a workbench tool, Prokit Workbench, as part of an ongoing effort to standardize procedures.

Childers' advice to other potential buyers? "If you are making a project-by-project decision, follow your nose. If a product can work for you, grab it." But if your group is trying to make a more global decision, he says, "Look at what you're doing first and then look for a good fit in a methodology. It sounds about as revolutionary as motherhood, but it's really true."

- **At least a year before you absolutely have to.** "If you're talking about moving new technology into an organization, it will take two or three years to adopt CASE," says George Timchal, systems specialist at Scott Paper Co. in Philadelphia. "You've got to be that far ahead."

Scott was originally looking for just an analyst workbench; it ended up with a formal methodology and a full life-cycle CASE product, the Information Engineering Facility from Texas Instruments, Inc.

"If your company is shrinking, then you might not want to invest in CASE, since it will cost you some overhead," Timchal advises. But, he adds, if you are simply pressed for time and are plugging away at the backlog with rapid prototyping, then "invest the time now so you won't have to rebuild those systems in a year or two." If your company is information resource-intensive, he says, "you should have been looking into CASE products a year ago."

From the industry side

Carma McClure, president of Extended Intelligence and a CASE consultant, agrees that MIS needs to break out of a wait-and-see stance this year.

McClure says she sees an information repository as the key to CASE's payoff down the road. Eventually, the repository would contain information on all requirements, specifications and data types for every application. That way, it could be used to build new systems and maintain

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Fiore is a *Computerworld* senior editor, features.

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detect design flaws sooner by spending more time validating design in the early stages. James Martin, industry consultant and author, estimates that design errors are 100 times more expensive to fix during systems maintenance than during analysis and design.

There was also a positive effect on communication — between developers and users as well as among developers. Communication with users was enhanced through the use of high-resolution graphics to represent such things as system flow and decomposition. Team members were forced to converse, since they operated on the same dictionary and could quickly determine what others were doing through the dictionary reporter.

Quantifying the efficiency improvements is difficult, but organizations such as Du Pont Co. report that they have become 10 times more productive as a result of CASE and adjustments to the development process. Still, the productivity gains of first-generation CASE could have been even greater if the products supported multiple users.

It was cumbersome to support a large project consisting of many separate workbenches and a central project dictionary. And because of the high cost, few stations were typically available for a project.

All in all, first-generation CASE has not been unsuccessful. It has found a home in many MIS departments in North America — but only in limited numbers and usually through the initiative of the MIS manager. Senior managers look for hard numbers, and MIS managers have been unable to quantify the salutary effects of first-generation CASE.

A new generation

Now, a new generation of CASE technology has burst onto the scene, sporting advanced features, a more expansive architecture and a more comprehensive approach to the systems development life cycle.

The new products support automatic code generation and data-driven techniques, such as information engineering and enhanced graphics capabilities. They offer project management functions or an interface to project management packages, as well as functions addressing strategic planning, estimating, construction and procedures.

A project dictionary on the mainframe that coordinates local dictionaries on the PC comes standard. In addition, the second generation includes a code generator on the mainframe and software on the PC for strategic systems planning.

The most significant automated deliverable is program code, including data base definitions and teleprocessor commands. Some new products are capable of converting a system design — in the form of action diagrams and screen and report definitions — into executable program code. Of all the characteristics of second-generation CASE, this one will have the biggest impact on the development process and the organization of the MIS department.

At present, code generators are not capable of producing code from free-form user requirement documents; consequently, they require very detailed specifications similar to application specifications. By incorporating code generation into the automated development process, the new CASE technology has, in effect, shifted the task of preparing application specifications to the earlier phases of analysis and design.

In the past, a disproportionate amount of the total systems development effort was spent in the coding and testing phases. These tasks have been simplified, allowing more time to get it right in the early phases of the process. This simplification means less risk of fundamental design errors and less expenditure for fixing mistakes, since they are detected and corrected early in the process.

Second-generation CASE will also decrease the cost of maintaining systems because of its capacity for providing information on the impact of changes. For example, an analyst can determine what processes would be affected by a change to a data entity.

Another automated deliverable is system specifications created from an analyst-defined specification. Some CASE products will even paint a screen from the information model. The results of this automation are increased developer efficiency and more current documentation.

CASE now recognizes the benefits of using the processing power of the mainframe, the distributed graphics capabilities of the PC and the inexpensive sharing features of local-area networks. These technologies are now integrated through "seamless" software interfaces available in some CASE tools. For example, users can download portions of the project dictionary from the mainframe, modify it and send it back to the mainframe for use in code generation.

In its new incarnation, CASE has also become methodology and technique specific. This is because code generators require that input contain specific data in a specific format. Although having the products tied to a particular methodology limits flexibility, the techniques supported are more advanced.

Second-generation CASE has improved the precision of detail contained in the system specification component. Where first-generation CASE provided the user with a blank slate to create a minispec, the second generation provides a highly structured set of window prompts into which analysts and designers enter information essential to generating code. The benefit is a more complete specification, since defining what details are required is no longer left to the discretion of the analyst or designer.

The advanced graphics capability of second-generation CASE rival those from computer-aided design and manufacturing (CAD/CAM); in fact, some of the new products have roots in the CAD/CAM world. Features such as panning, zoom and pop-up windows are now standard. Some packages allow users to customize the graphics and create icons in place of the standard symbols.

Another improvement in the user interface, and one that settles a major criticism of first-generation CASE, is the strengthening of the reporting capability. Second-generation CASE allows users to control the appearance of the output and print it using many types of devices, including laser printers. Some of these products also include bridges to desktop publishing packages such as Xerox Corp.'s Ventura Publisher to allow users to create professional documents in which graphics and text reside on the same page.

The human engineering factor has also been improved by replacing menus with Apple Computer, Inc. Macintosh-like windows. In this way, the tool can better emulate the human thought pattern of bouncing from one area of the systems specification to another without having to back out of one subsystem to reach another. CASE is now a tool for analysts, designers *and* users. Involving users in development projects results both in more user satisfaction and more effective systems.

Remaining drawbacks

While the benefits of second-generation CASE will be significant and affect everyone from the MIS manager — responsible for the strategic systems plan — to the maintenance programmer, who is now expected to understand the fundamentals of systems analysis and design, the technology is not without deficiency.

Cost will continue to be the primary stumbling block. One of the major drawbacks of second-generation CASE is the upfront cost of the software and the hardware required for developers. Currently, the cost of CASE for a data processing department of 50 developers can exceed $1 million, excluding the cost of the mainframe usually required to process the project dictionary and code generator.

Futhermore, while most products support the majority of features mentioned — including automatic code generation — not all second-generation CASE products possess all these characteristics. And, for that reason, it is important to analyze each product individually before making a commitment.

In addition, this category suffers from the same bugs associated with any new product. For example, one of our offices was using the clustering function of a second-generation CASE product and had to terminate the process after 40 hours of operation on a mainframe. The vendor subsequently agreed something was wrong and provided a fix that performed the same function on a PC in less than six minutes.

Function processing speed on the PC is, at this juncture, still an issue. While CASE manufacturers have done an exceptional job using what processing power is available with Microsoft Corp. MS- or IBM PC-DOS to drive their sophisticated software, many products still become unacceptably slow when used on medium-size to large projects. It is hoped that the Intel Corp. 80386-based processor and the OS/2 operating system will eventually resolve this problem.

Coverage of the entire systems development life cycle has also not been fully realized. Second-generation CASE goes much further than the analyst and designer workbench, but no one product is commercially available that addresses all phases and steps of the systems development life cycle. This complete coverage is coming, but users will have to be patient and live without it in the short term. As a result, tools or techniques in addition to CASE will be required for any project.

Dangerous overlap

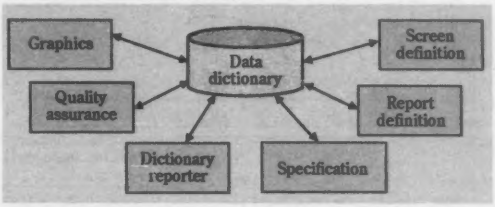
At present, the functions of CASE and the fourth-generation language development environment overlap. Specifically, both include data dictionaries, screen painters and report generators.

Developers will have to make compromises when using the two technologies on the same project. For example, the screen generators of fourth-generation development software are usually more advanced than those found in CASE, so it makes sense to use them on the project. However, to use the screen generator, the fourth-generation language usually requires that the data elements be defined in the data dictionary. Therefore, the developer is forced to duplicate the dictionary.

No standard is in place for exchanging information with CASE products, and without standards, users are restricted to one vendor for all their CASE needs. There is some good news in that the National Bureau of Standards is now in the process of developing CASE dictionary

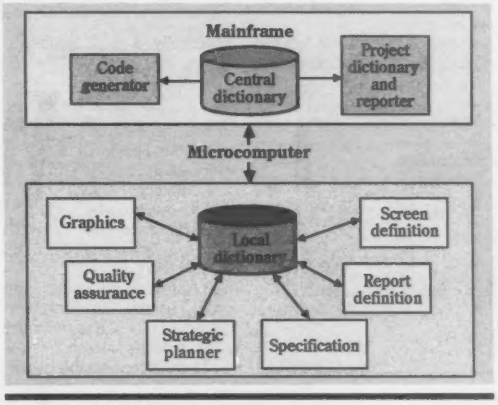
First-generation CASE

Early tools included seven components but addressed only a portion of the systems development life cycle



Second-generation CASE

The latest technology offers advanced features, more comprehensive life cycle coverage and utilization of mainframe power



standards, but, as was the case for data communications, these standards could wait years for industry recognition.

Applying the new

Implementation of second-generation CASE is no trivial matter. It requires the MIS department to make some fundamental changes. Some organizations are buying tools such as CASE and incorrectly assuming these tools include the methods and techniques. Others are buying CASE and assuming it fits with their current methods and techniques. This compatibility is not likely, considering that most companies are still using some variation of the traditional systems development methodology.

Since second-generation CASE comes close to allowing a completely automated approach to systems development, the manual methods and techniques of the traditional development methodology must be revamped to recognize these developments in automation. Otherwise, efficiency and effectiveness gains will be limited.

What is needed is an advanced systems development methodology that offers different methods and techniques for a variety of project environments. In order to be flexible, this advanced methodology should be broken into its different components of methods, techniques and tools, with a separate standards section describing how to tailor the process according to the demands of the specific project environment.

This flexibility, which will also allow organizations to change tools with only minimal modifications — if any — to the methods and techniques employed, is an important factor, considering that new CASE tools will continue to be developed and may be replaced when something better comes along.

The new methodology should also reflect recent developments in technology by assuming an integrated process in which the output of one step is reused and further enhanced to develop the output of the next step. Finally, whereas the traditional development methodology was process-driven, the new methodology must incorporate advanced, data-driven techniques to reflect the importance of data in the organization.

Since not one currently available CASE product can satisfy all project needs, organizations must understand their own technology needs. They must identify the tools that can be used together without cumbersome manual interfaces.

You may have to make some compromises. If, for example, you decide to use your fourth-generation language screen generator during the systems development exercise, there is no advantage in buying a CASE tool that has a built-in screen prototyper. Other technologies that must be compatible include project management software, code generators, data base, third- and fourth-generation languages, teleprocessors and system software on the mainframe.

Human factors

Several human factors related to changing work patterns and roles must also be considered when implementing CASE. Developing systems using CASE technology requires more discipline than using the manual approach.

CASE tools require specific information in a predefined format with no deviation. This requirement has moved systems development closer to an engineering approach from a make-it-up-as-you-go process. Since discipline is seldom seen in systems development, introducing it could result in opposition to the new tools.

Without a new methodology to enforce discipline, the analyst, designer and coder will cling to their old ways of developing systems and attempt to incorporate the tool into this process. This incorporation will actually result in decreased efficiency because of the incompatibilities between the old approach and the new tools. Much time will be wasted creating unnecessary documentation and resolving differences in techniques.

A second human factor consideration relates to changing roles. Because boundaries between analysts, designers and coders have been removed, organizations will need to retrain their existing maintenance programmers.

Today's systems professional is called a developer, but he crosses the boundaries of analysis, design and coding. The job of maintenance programmer used to entail reviewing documentation, reanalyzing systems to understand the impact of the required changes and coding; in a CASE environment, this person is more of an analyst and designer who uses the tool to analyze where changes have to be made and then modifies the design to regenerate the program code. The role and the skill requirements for these individuals are completely different.

There is considerable cost involved in retraining current personnel for the broader responsibilities of a developer and in acquiring PCs for developers, as well as both PC and mainframe software. Because of this, senior management must also be willing to adjust its delivery expectations in recognition of the way that second-generation CASE affects the development life cycle.

In the past, developers commonly rushed into the coding and testing phases, spending little time analyzing and designing the system. The result was that users and managers received some working programs early in the project. CASE technology shifts this time commitment, so that a large percentage of the total systems development effort is spent in the analysis and design phases, with relatively little time committed to coding and maintenance.

Without senior management's understanding of CASE technology, developers will start along with the second time curve, which demands the up-front effort, and be forced to drop down to the first curve because management still expects early results.

Because retraining and reorienting the resources of the MIS department to implement CASE requires an enormous effort, converting the entire systems development function to CASE without a pilot test could be disastrous. The best approach is to identify highly visible or important development projects and test the product with a group of eager developers capable of adapting to new methods, techniques and tools. The benefits of the product will quickly spread by word-of-mouth.

Still to come

CASE will continue to develop with the advent of artificial intelligence, more powerful multiuser microcomputers and data standards for CASE dictionaries.

The biggest challenge left is to further automate the system specification process, allowing developers to generate systems without having to provide as much detail as is currently required. By using AI, CASE will be able to store knowledge about the systems environment for reference on later projects. When this happens, fewer details will be required, and end users will play a large part in systems development by feeding the CASE tool with facts through a high-level language interface.

Retention of knowledge about the systems environment will also enable CASE to perform a number of additional functions, including the following:

- Handling the physical data base design, given the logical design and performance objectives.
- Identifying risk areas in which the system may not achieve business objectives. This process may be too large in scope and require too much processing time in an on-line environment. CASE would not only identify the risk but would suggest alternatives to address the risk.
- Performing automated testing by constructing the different business conditions, including exceptions and exercising the program logic. Future CASE is likely to execute tests in the system model, rather than in the program code, so that testing becomes independent of the language generated.

Dictionary drama

The eventual appearance of CASE data dictionary standards will substantially change the nature of the CASE market. Currently, users of CASE must depend on one vendor for the CASE product and surround it with other tools to meet the total project needs. These other tools are not yet capable of interchanging data with CASE and require rekeying.

When data dictionary standards appear, however, it will be possible to create a hybrid CASE product that best satisfies users' specific needs. For example, a user could buy a CASE data dictionary and "plug in" the best modules for project management, estimating, graphics and code generation.

In addition, screen generators and report generators of the fourth-generation development environment would be able to work from the CASE data dictionary to provide requirements prototyping.

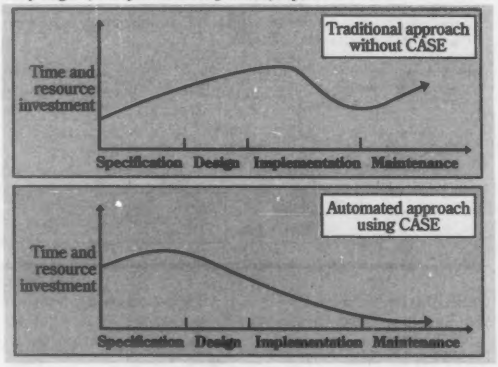
With the capacity to mix different vendor products will come more competition, lower prices and specialization. Vendors will be forced to specialize in one area of CASE, such as graphics.

Furthermore, powerful multiuser microcomputers will help CASE become more cost-effective for smaller data processing departments, conceivably eliminating the need for the mainframe to coordinate multiple users and provide the processing power for code generation.

CASE is still an evolving technology, but its potential is now clear and, given that a successful implementation is usually a gradual one, organizations should make a start in this product generation. •

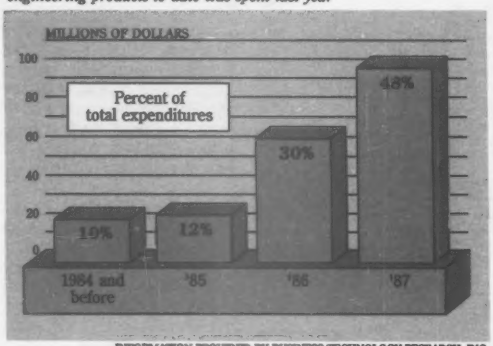
Shifting the load

CASE technology moves the bulk of time and resource commitment to early stages of the systems development life cycle



Picking up the pace

Almost half of the money invested in computer-aided software engineering products to date was spent last year



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> WITHOUT a new methodology to enforce discipline, the analyst, designer and coder will cling to their old ways of developing systems.

Prepping for the Turing test

BY STU COLEMAN

Artificial intelligence research is making a significant contribution to computer-aided software engineering (CASE) tools. Vendors are building rule-based languages and object-oriented data base managers into product infrastructures. This adoption of AI-based technologies is helping to assimilate professional expertise into CASE products.

An example of this is AI-based reverse-engineering tools. These tools start with the legacy of existing systems, using their data bases and program code as sources of input to generate more efficient, stable equivalents.

All the leading workstation-based CASE products now use some form of AI technology. They provide varying degrees of expert assistance; support multiple methods, such as data flow diagraming, logical data modeling and matrix processing; and address a broad spectrum of the system life cycle.

WE ARE witnessing the evolution of CASE tools toward a more mature focus on full-spectrum system engineering.

In fact, the purview of CASE tools is expanding. Emerging products — management as well as software development tools — do far more than support just software development. Some of them support information system architecture development as well as a strategy to improve an enterprise's overall information resource management capability.

We are witnessing, and in fact are participating in, the evolution of CASE tools from an embryonic focus on software engineering toward a more mature focus on full-spectrum system engineering and — still to come, but visible — information resource management.

What AI can do for CASE

In the early 1950s, mathematician and computer scientist Alan Turing proposed an intelligence test for machines. Those that passed the test could be said to have intelligence. The test was based on the machine's ability to imitate a human being and was called the Imitation Game.

Turing proposed that if a human subject failed to distinguish between a man imitating a woman via a teletype and a computer imitating a man imitating a woman, then the machine would have won the game. The focus of the test was not on distinguishing the difference between a man's dialogue and a woman's but on the machine's ability to imitate human dialogue in such a manner that real humans would be unable to discern that they were dealing with a machine.

Whether Turing's test could ever be passed by a computer is still a matter of debate, but the Imitation Game does illustrate the nature of our expectations concerning AI machines. It also serves to illustrate the nature of our expectations about the use of AI in future CASE tools.

We are expecting that AI will enable CASE tools to become participants in the information resource management and system engineering and software engineering process.

A lot of ground must be covered before such expectations can be fully realized, but in the next five to 10 years, we are going to see some rather remarkable progress, particularly in the following areas:

• **More expertise.** The drive to add more capability to CASE tools will continue. But the nature of processing will become increasingly rule- and pattern-sensitive. Expanded rule-based processing will foster methodological rigor and produce more complete and consistent results. Improved analytical support will be provided via expanded pattern-matching capabilities.

More management-oriented functionality will appear. AI techniques will improve the ability of CASE tools to address issues permeated with assumptions, interpretations, intuitions, approximations, inferences and deductions — the stuff management is made of.

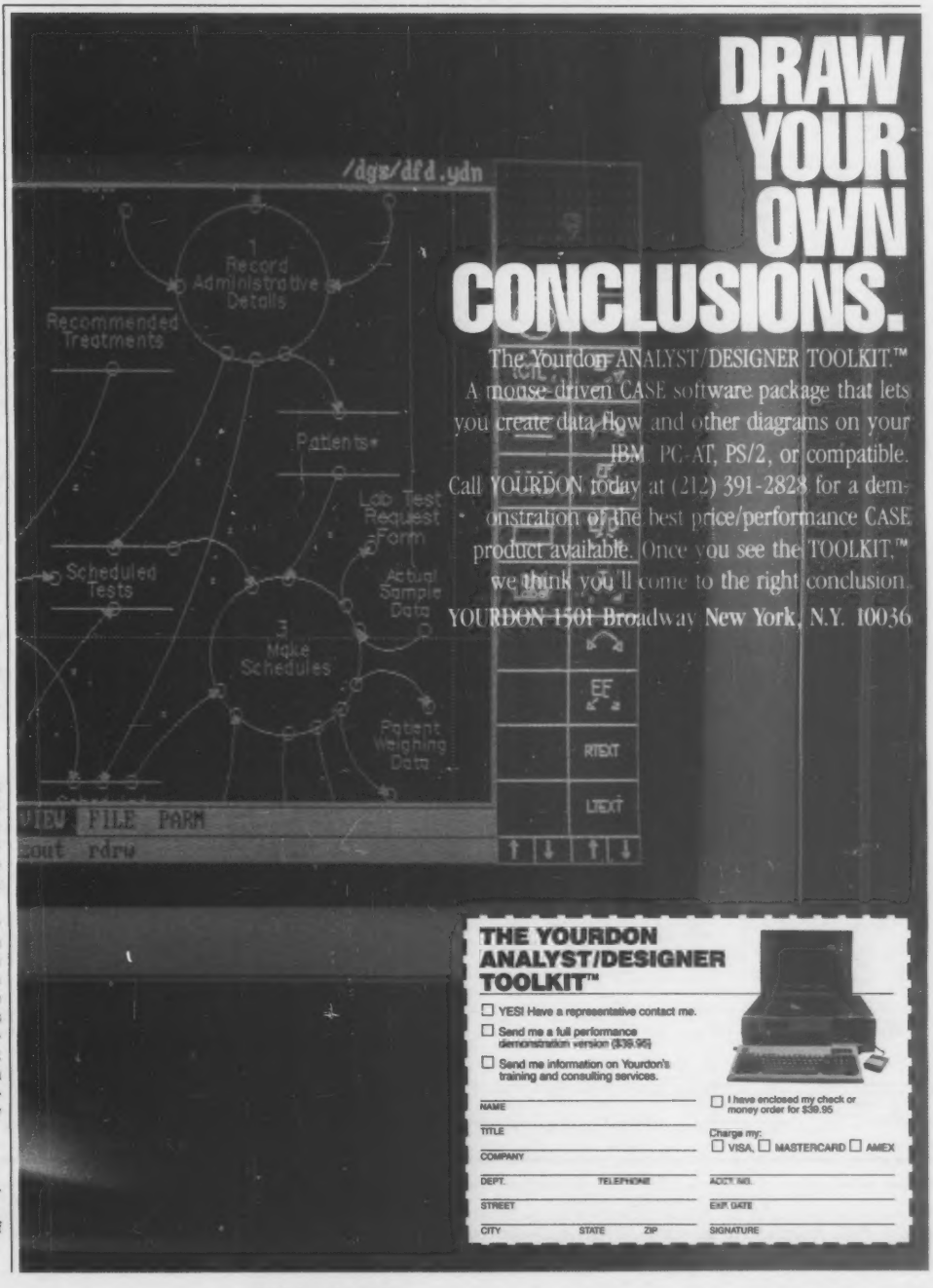
• **More human adaptability.** Most CASE tools are not particularly bright conversationalists, making dialogue somewhat stilted and intellectually dull. Even when limited to specific areas of expertise, today's CASE technologies fail the Turing test miserably.

In the next three to five years, we can expect to see AI advances enable two particular kinds of changes in this area. The first is the CASE tool's ability to extract much of the information it needs from structured, or guided, natural language dialogue with a human subject.

The second is the tool's ability to

Continued on page S16

Coleman is vice-president of Pacific Information Management, Inc. in Santa Monica, Calif., a consulting firm specializing in information resource management. His conclusions are based on the results of recent research conducted for MIT and Texas A&M University.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CASE tool kits/workbenchs

COMPANY	PRODUCT	HARDWARE PLATFORMS	SOFTWARE PLATFORMS	TOOL KIT/WORKBENCH	METHODOLOGIES SUPPORTED	ANALYSIS AND DESIGN TECHNIQUES SUPPORTED	DIAGRAMS CREATED	SCREEN/REPORT PAINTING	PERMITS SIMULATION OF EXECUTION	AUTOMATIC ON-LINE OR BATCH CODE GENERATION	BUILT-IN PROJECT MANAGEMENT FUNCTIONS	WINDOWING CAPABILITY	SPECIFICATION PROMPTS	INCLUDES MAINFRAME PROJECT DICTIONARY/ DOWNLOAD CAPABILITY	MULTIUSER SUPPORT/METHOD	PRICE
ADPAC Corp. (615) 974-6000	Diagraphics for data processing	IBM mainframes or compatibles	NA	Tool kit	Yourdon, Gane-Sarson	Diagramming	Data flow, entity relationship, data model	No	No	Batch	None	No	Yes	No	Yes	$28,000
	Design	IBM mainframes or compatibles	Generic to all DBMSs[1]	Tool kit	Any that requires data normalization	Bachman	Bachman data structure	No	No	NA	None	No	Yes	No	Yes	$28,000
Advanced Technology International, Inc. (312) 947-4755	Supercase	VAX	Ada, C, Fortran, Jovial, Pascal, PL/M	Workbench	Object-oriented design, reverse engineering	PDL, Parnas, Yourdon	Yourdan structure charts, System top-level architecture, package dependencies	Report	No	Both	Project monitoring	No	Yes	No	Yes	$15,000-$87,500
AGS Management Systems, Inc. (315) 265-1550	Model/Case	IBM PC, PC XT, AT or compatibles, PS/2 Models 30 to 80	MP	Both	SDM/2(structured (proprietary), Yourdon, Gane-Sarson	Yourdon, Gane-Sarson, DeMarco, Merise, Chen, Jackson, Martin, Finkelstein	Data flow, data model, entity relationship, structure, presentation graphs	Both	Yes	No	Yes	Yes	Yes	Yes	Yes	$54,000 +
Apollo Computer, Inc. (617) 256-6600	Domain Software Engineering Environment	All Apollo workstations	C++, C, Fortran, Pascal, Common LISP, Ada	Tool kit	NP	NA	NA	NA	NA	NA	Monitor, task management	Yes	Yes	No	Yes	$2,000
Applied Data Research, Inc. (201) 874-8000	Depictor	IBM mainframes, PCs or compatibles	Datacom/DB	Tool kit	Methodology independent	Entity, binary relationship; data model	Entity relationship, data model	Report	NA	NA	None	No	Yes	Yes	Yes	$18,500
American Management Systems, Inc. (703) 841-6060	Life Cycle Productivity System	IBM PC AT or compatibles, PS/2, mainframes, VAX	Cobol, IMS, IDMS, Adabas, VSAM, C	Workbench	Structured analysis, design, (SDM-70, Stratus)	Yourdon-DeMarco, Constantine, Jackson, Chen, Inmon	Data flow, program structure, entity relationship, data model, hierarchy, presentation	Both	Yes	Both	Tracking, financial management, project estimating	No	Yes	No	Yes	$6,000-$16,000 (PC components); $100,000-$275,000 (mainframe)
Arthur Andersen & Co. (312) 507-5161	Foundation	IBM PCs, mainframes (MVS) or compatibles	DB2, Cobol II, OS/VS Cobol	Workbench	Similar to Yourdon	Structured analysis, design	Yourdon data flow, Warnier-Orr structure charts, open entity relationship	Both	Yes	On-line	Automatic work plan generation, budgeting, scheduling, time recording	No	Yes	Yes	Yes	$300,000
Atherton Technology, Inc. (408) 734-9822	Software Back plane/ Project Softboard	Sun 3 series, VAX/VMS	SCCS, CMS	Workbench	Methodology independent	Software Back plane can interface with any analysis, design tool	NA	NA	NA	NA	Project Softboard, tracking	Yes	Yes	Software Back plane	Software Back plane	$4,950-$89,500/ $1,150-$20,800
Bachman Information Systems, Inc. (617) 354-1414	Bachman/ Data Analyst, Bachman/ Data base Administrator, Bachman/ Data base Administrator (DB2), Bachman/ Workstation Manager	Compaq 386, 386/20, IBM PS/2 Model 80	IDMS, DB2	Tool kit	Methodology independent	Bachman entity relationship	Bachman ER, IDMS, DB2	No	No	Batch	None	Yes	Yes	No	No	$35,000
Cadre Technologies, Inc. (401) 351-CASE	Teamwork (family)	Apollo workstations, Sun, IBM PC RT, Vaxstations, HP 9000	Ada, C, Pascal, Cobol, Fortran	Workbench	Yourdon- DeMarco structured analysis, Boeing-Hatley real-time extensions	Chen information modeling/entity relationship, Constantine- Page-Jones, Buhr Ada structure	Data flow, entity relationship; state transition, decision, process activation tables; state event matrixs; structure charts	No	Yes	Both	Status labels	Yes	Yes	No	Yes	$995
The Cadware Group, Ltd. (800) CADWARE	Software Engineering Package	MS-DOS; IBM PC AT or compatibles, PS/2	Dbase	Tool kit	Yourdon	Yourdon, Gane-Sarson, Chen, Constantine, Ware, Merise	Data flow, entity relationship, structure charts, control flow	Both	Yes	NA	None	No	No	Yes	Yes	$1,250
Catalyst (800) 323-3089	Pathvu/ Retrofit	IBM MVS/OS mainframes, Wang VS, Unisys A, V & 1100, Honeywell DPS 8/88	None	Tool kit	NP	None	None	No	Yes	NA	None	No	No	No	Yes	$32,900 (Pathvu); $99,500 (Retrofit)
CCI Systems, Inc. (914) 735-8630	Pacbase	IBM 370, Honeywell Bull I/PS 8/88/90/8000, DPS 7/7000, DPS/90 Unisys 1100/2200	DB2, DL1, IDMS, IDS, DMS 100, Terradata, Adabase	Workbench	Merise, Yourdon	Conceptual, logical, physical	Conceptual, logical data models, data flow, program job flow, entity relationship	Both	Yes	Both	Via assembler	Yes	Yes	Yes	Yes	$250,000
Chen & Associates, Inc. (504) 926-5765	ER-Modeler	IBM PC, PC XT, AT or compatibles	IMS, DB2, IDMS, Datacom/DB, Oracle, Ingres, Dbase, Zim	Workbench	Entity relationship, information engineering, relational normalization, reverse data base engineering	Entity relationship, relational normalization	Entity relationship	Both	No	No	None	Yes	Yes	Yes	Yes	$3,495-$5,995 for entire package (modules sold separately)
Cincom Systems, Inc. (513) 662-2300	The CASE Environment	IBM PC, PS/2; Vaxstations 2000; Apollo, Sun	DB2, IMS, VSAM, IDMS, Supra	Tool kit	Yourdon, Jackson, Gane-Sarson	Requirement analysis planning, activity modeling	Data flow, entity relationship, structure charts	Both	Yes	On-line	Yes	Yes	Yes	Yes	Yes	$10,000 +
Clear Software, Inc. (617) 232-9758	Clear	IBM PC, PC XT, AT or compatibles, PS/2	Dbase, Cobol, C	Workbench	NA	NA	Theoretical, flow charts	Both	Yes	NA	None	No	No	Yes	Yes	$99.95-$149.95
The Coding Factory, Inc. (301) 881-0160	Cofac	IBM PCs or compatibles	Cobol	Tool kit	Methodology independent	None	None	Both	No	Both	None	No	Yes	Yes	No	$1,995
Cognos Corp. (613) 738-1440	The Power-House Link to Excelerator	IBM PC XT, AT, PS/2, 3270 PC, 3270 AT; Compaq 286, Compaq Plus, Port III; HP Vectra; AT&T 6300; compatibles	Powerhouse	Workbench	Methodology independent	Data modeling, process flow	Powerhouse entity, system, plus those created by Excelerator	Both	Yes	Both	As through Excelerator	No	No	Yes	Yes	$1,680
Computer Corporation of America (617) 492-8860	Accolade	IBM mainframes running CICS	VSAM, DB2, Model 204, IMS	Workbench	Methodology independent	Depends on methodology	None	Screen	Yes	Both	Yes	No	Yes	Yes	Yes	$30,000-$125,000
	Accolade/PC	IBM PCs or compatibles	VSAM, IMS, SQL	Workbench	Methodology independent	Depends on methodology	None	Screen	Yes	Both	Yes	No	Yes	Yes	Yes	$1,500

[1]Data base management systems [2]Structured data models [3]Entity relationship application [4]Learmonth & Burchett's system development method [5]Data structured systems design

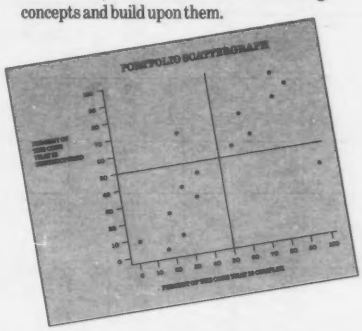
The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, this is designated NP (not provided). When a question does not apply to a vendor's product, this is designated NA (not applicable). Further product information is available from the vendors.

The COBOL systems you want to develop may be the systems you already have.

Take a good look at the new systems development requests piling up in your shop and you'll see something interesting. What many users are really asking for aren't "new" systems; they're enhanced versions of your existing systems.

Why do they ask for these enhancements, rather than substantially new systems? Because existing systems remain crucial to the day-to-day workings of your company, regardless of how error-prone, complex and difficult to maintain they become.

Yet, inside every old program, beneath the patches and bug fixes and layers of chaotic code, well-written elements of the original design wait to be discovered. Imagine how productive your shop would become if you could systematically reach inside, extract those fundamental design concepts and build upon them.



At a glance, the Portfolio Scattergraph can reveal the comparative quality of every system in your software portfolio.

Of course, your maintenance and enhancement work would be simplified. But you could also apply those elements to new systems development, reducing the time, effort and risk involved.

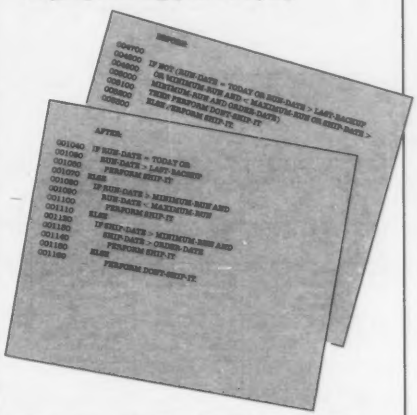
These are the benefits you'll realize with re-engineering tools from Language Technology.

Our products apply the concept of Computer Aided Software Engineering (CASE) to the work that dominates the average day in a mainframe shop: maintaining and enhancing existing systems.

RECODER is the leading re-engineering tool available. It can transform any unstructured program – no matter how complex and hard to comprehend – into a structured version that you can both understand and maintain more easily.

INSPECTOR is the only COBOL quality assurance tool that uses industry standard measurements to objectively evaluate code. You can also customize INSPECTOR to measure any standards you want to create.

At Boeing, Mellon Bank, Shell Oil, The Hartford Group, Ford and other Fortune 500 companies, Language Technology products are boosting programmer productivity and enhancing the quality of existing systems every day.



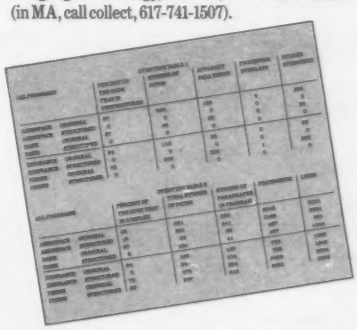
After software re-engineering, users achieve a 20-50% increase in programmer productivity. They also see fundamental design concepts that were previously hidden.

If you spend 50% or more of your programming dollar maintaining and enhancing existing systems, re-engineering tools from Language Technology will be a cost-effective weapon in your CASE tool kit.

And, since our tools improve existing systems, the backbone of corporate operations, every department becomes more efficient and profitable thanks to your efforts.

Our Re-engineering Information Package details the facts and substantial rewards of this comprehensive strategy. Our Software Portfolio Analysis will clearly illustrate specific areas where you'll save time and money by applying re-engineering techniques to your existing COBOL systems. Both are free.

Don't wait for maintenance and enhancement efforts to overwhelm you. Return the coupon or call Language Technology, toll-free, **1-800-RECODER** (in MA, call collect, 617-741-1507).



The Program Overview Table helps programming managers target the programs which will benefit most – in terms of enhanced code quality and greater efficiency – from re-engineering.

The CASE for re-engineering

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COMPANY	PRODUCT	HARDWARE PLATFORMS	SOFTWARE PLATFORMS	TOOL KIT/WORKBENCH	METHODOLOGIES SUPPORTED	ANALYSIS AND DESIGN TECHNIQUES SUPPORTED	DIAGRAMS CREATED	SCREEN/REPORT PAINTING	PERMITS SIMULATION OF EXECUTION	AUTOMATIC ON-LINE OR BATCH CODE GENERATION	BUILT-IN PROJECT MANAGEMENT FUNCTIONS	WINDOWING CAPABILITY	SPECIFICATION PROMPTS	INCLUDES MAINFRAME PROJECT DICTIONARY/ DOWNLOAD CAPABILITY	MULTIUSER SUPPORT/METHOD	PRICE
Computer Sciences Corp. (703) 876-1000	Design Generator	IBM PC AT or compatibles	Smalltalk	Workbench	Structured, transfer analysis; structured design	Automatic generation of structured charts	Data flow, structure charts	No	No	NA	None	Yes	Yes	No	Yes	$5,000 per copy
Cortex Corp. (617) 894-7000	Corvision	VAX	RMS, RDB	Workbench	Rapid prototype	None	None	Both	Yes	Both	Guidance system	Yes	Yes	No	Yes	$50,000-$200,000
Cullinet Software, Inc. (1-30) 982-4888	IDMS/ Architect	IPM PC AT, PS/2 Model 60 and up or compatibles	Self-contained	Workbench	LXRM, partial support for Chen, Yourdon, Gane-Sarson	Entity relationship, data flow, logical data structuring, structure analysis, finite state machine concepts	Logical, physical data, application structure; data flow	Screen	Yes	On-line	None	No	Yes	Yes	Yes	$8,000
Deft, Inc. (410) 249-2346	Deft	Mac	Ingres, Oracle, RDB, DB2	Workbench	Gane-Sarson, Yourdon, Bachman, Chen, Martin, Jackson	NA	Data flow; entity relationship; program structure; form, report	Both	Yes	Both	None	Yes	Yes	Yes	Yes	$9,000-$250,000
Easypac, Inc. (713) 480-3233	Easypac	VM/CMS, VAX/VMS, IBM PC or compatibles	C, proprietary	Tool kit	Core, ERA[2]	Modeling	ER, CORE	Both	No	Both	Control, status	Yes	Yes	Yes	Yes	$3,000 (PC); $4,000-$16,000 (VAX/ VMS); $20,000 (VM/CMS)
Errico Technologies, Inc. (213) 396-3844	AMS-Team	9370-up to 3090-class IBM or compatibles	Cobol, CICS, VSAM, DB2	Tool kit	Methodology independent	Any process or data centered approach	None	Both	Yes	Both	Task management, budget vs. actual, schedule	No	Yes	Yes	Yes	$150,000-$340,000
Hewlett-Packard Co. (617) 663-1500	HP Teamwork SA/RT/SD/-IM/ Access	HP 9000 Series 300 workstations	HP-	Workbench	Yourdon-DeMarco, Chen, Hatley, Yourdon-Constantine, Page, Jones, Ward-Mellor	Functional analysis, design; object-oriented analysis, design; Ada, Buhr design	Data, control flow; structure charts; entity relationship; control specifications; state transition	Report	No	Both	Status labels	Yes	Yes	Yes	Yes	$1,600-$7,500
Holland Systems Corp. (313) 995-9595	4Front Strategy	IBM mainframe, PC, PC XT, AT or compatibles	Generic	Tool kit	The Holland Systems Strategic Planning Method	Business function, entity modeling; information systems planning, diagramming	Micro	No	No	NA	Project manager workbench templates	No	No	Yes	Yes	$97,000
	Design 4 Data	IBM mainframe	Generic	Tool kit	Holland Systems Data Modeling Methods	Data modeling, view synthesis, entity relationship modeling	Output	No	Yes	Both	Methods guided by Project Manager Workbench templates	No	No	Yes	Yes	$45,000
IBM Contact your local IBM dealer	Professional Work Manager, V2/Workstation Aided Software Engineering	IBM PS/2 Models 30, 50, 60, 80, PC AT, 3270	PC-DOS	Workbench	Methodology independent	Methodology independent	Methodology independent	Both	Yes	NA	Task Management to assist in monitoring projects	Yes	NP	No	No	$300-$600
Iconix Software Engineering, Inc. (213) 458-0088	Powertools	Mac Plus, SE, II	Any DBMS, language templates allow use of any language	Workbench	DeMarco, Hatley, Ward-Mellor, Yourdon	DeMarco, Hatley, Ward-Mellor, Yourdon	Data, control flow; state transition; state tables; state event matrix; structure charts	Both	No	NA	None	Yes	Yes	Yes	Yes	$4,495
I-Logix, Inc. (617) 272-8000	Statemate	Workstations, Sun, Apollo	Integrated DBMS	Tool kit	Methodology independent	Functional, structural, behavioral	Activity, module, state charts	Both	Yes	Both	Yes	Yes	Yes	Yes	Yes	$10,000/ $25,000
Index Technology Corp. (617) 494-8300	Excelerator	IBM PC, PC XT, AT, PS/2 or compatibles; Vaxstation; Sun 3 series; Apollo 3000 series	Cobol, PL/1, Oracle	Workbench	Stradis, SDS/structured information engineering	Gane-Sarson, Yourdon, Jackson, Constantine, Chen, Bachman	Data flow, Structure charts, entity relationship	Both	Yes	No	None	Workstations only	No	No	Yes	$8,400
	Excelerator/ RTS	IBM PC, PC XT, AT, PS/2 or compatibles; Vaxstation; Sun 3 series; Apollo 3000 series	Cobol, PL/1, Oracle	Workbench	Ward-Mellor, Hatley	Hatley, Constantine, Chen, Jackson, Bachman, Yourdon, Gane-Sarson	Transformation, block, matrix graphs; structure charts; entity relationship; state transition; data model	Both	Yes	No	None	Workstations only	No	No	Yes	$8,400
Info Dyne International, Inc. (312) 663-1166	Master the Information Architect	IBM PC, PC XT or compatibles	Dbase III	Tool kit	Data or process driven	Entity relationship models, structured design	Entity relationship, data flow	NA	Yes	NA	None	No	Yes	No	No	$2,900-$4,200
Integrated Systems, Inc. (408) 980-1500	Autocode	VAX/VMS	C, Fortran, Ada	Workbench	Ward-Mellor, Boeing-Hatley	Block diagrams	Block	Both	Yes	On-line	None	Yes	Yes	No	Yes	$29,000
Interactive Development Environments (415) 543-0900	Software through Pictures	Sun workstations; Apollo workstations; Vaxstations — VMS, Ultrix	C, Ada, Pascal, database schema generator, ANSI SQL, DB2, Informix, Ingres, Oracle, Sybase	Workbench	Yourdon-DeMarco, Gane-Sarson, Jackson, Chen, Hatley-Pirbhai, Wasserman	Methodology independent	Control specification tables; state transition, data flow, data structure, entity relationship, transition; structure charts	Both	Yes	Both	Yes	Yes	Yes	No	Yes	$5,000-$15,000
Interactive Software Engineering, Inc. (805) 685-1006	Eiffel	VAX; Sun; Apollo; IBM PC, PC AT, RT, PS/2 (Xenix); HP 9000/300, 9000/800 series	Unix, C, Xenix	Workbench	Object-oriented design, programming	Object-oriented analysis	Inheritance, class dependency	Both	No	Both	Automatic documentation	Yes	No	No	Yes	$2,995+
Knowledgeware, Inc. (404) 231-8575	IEW/PWS/ AWS/DWS/ MPE/ GAMMA	IBM MVS, AT, 3270 PC, PS/2 Model 50 and up; Compaq 286, 386	Cobol, DB2, IMS, IDMS, IDMS/R, VSAM	Workbench	Methodology independent	Yourdon, DeMarco, Constantine, Martin, Page-Jones	Decomposition; entity relationship, data flow, action, data base association, property matrixes; structure charts; presentation	Both	Yes	Both	Yes	Yes	Yes	Yes	Yes	$7,500-$100,000
Learmonth & Burchett Management Systems, Inc. (713) 682-5530	Auto-Mate Plus	IBM PC AT or compatibles, PS/2	IDMS, DB2, Adabas	Workbench	LSDM[4], Chen	Data flow, on-line dialog design, structured, entity modeling	Flow, structure charts; presentation graphics for IDMS, DB2, Adabase	No	Yes	Both	No	Yes	No	Yes	No	$7,500
Manager Software Products, Inc. (617) 863-5800	Method-manager	IBM 370, PC, PC XT, AT, PS/2 or compatibles	DB2, IMS, DL/1, SQL, Adabas, IDMS, System 2000, Cobol, PL/1, assembler, Mark IV	Workbench	Method-manager, information engineering	Yourdon, DeMarco, Gane-Sarson, Jackson, entity relationship analysis, Bachman, entity life history, affinity analysis, functional decomposition, entity modeling, data normalization	Data flow; data, entity, structure; custom	Both	Yes	Batch	To be released	Yes	Yes	Yes	Yes	NP
McDonnell Douglas Information Systems Co. (800) 325-1067	Prokit Workbench	IBM PC, PC XT, AT, 3270 PC, PS/2 or compatibles	MS-DOS	Workbench	Stradis, any other life cycle management methodology	Structured analysis; derived, strategic design	Gane-Sarson, Chen, Bachman, Constantine	Both	Yes	No	None	Yes	Yes	No	Yes	$9,200
Meslo Business Systems (415) 948-7920	Foundation Vista, BASYS, Design Translator, CDUX	Mac, Mac II; Tandem CLX, VLX, TXP, EXT10, EXT25, TNSII	Pathway; Cobol 68, 74; SQL	Workbench	Gane-Sarson, Yourdon, Chen, Jackson	Utilize full-function data dictionary	Data flow, entity relationship, screen design	Both	Yes	Both	Yes	Yes	Yes	Yes	Yes	$79,500

On-Line Software Introduces an Old Concept.

The Strateg

Casablanca...President Franklin D. Roosevelt and Prime Minister Winston Churchill find something to chuckle about during their historic meeting. (Credit: Bettmann)

Like it or not—and we do—we all live and work in an IBM world.

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We work with IBM.

Let's work together.

Sure, there are proponents of minis and micros.

One wishful company even ballyhooed a mid-frame and when that didn't pan out they created a small-frame.

But the undeniable fact is that Big Blue has taken this industry and created it in its own image.

Pardon us if we seem a trifle unadventurous but we think we know a winner when we see one, so where IBM goes, we follow.

We fill their gaps. Plug their holes.

Write programs they don't have time for.

In short, make the whole thing run just a little bit better.

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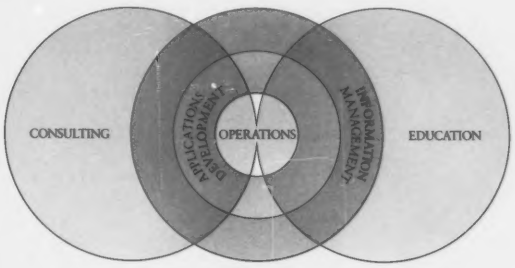
■ WE'RE LOOKING FOR A YES MAN.
OR WOMAN.
OR BOTH.

At most companies there are a hundred people who can say no but only a few who have the authority to say yes.

We're looking for those people. A few good men you might say.

And, at the risk of sounding high and mighty, there's something in it for you.



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Big guns for big hitters, if you'll allow us to mix a metaphor. What's in it for you?

Help.

Help with product evaluations, help with training, help with technical consulting and systems integration, help with applications development, operations and information management.

Sure, it's all available individually from other sources, if you have the time to wait for ten different phone calls from ten different reps.

We're betting you're too busy for that.

We're betting you're ready for an alliance, an understanding between yourself and a company whose charge in life is to take what IBM has created and make it better.

A strategic alliance.

It works in other businesses every day.

It works for politicians.

It works for lovers.

It even works for kids on the playground.

It worked for Roosevelt and Churchill.

It can work for us.

"I WAS AN MIS DIRECTOR FOR 27 YEARS.
I ALLOWED ONE VENDOR LUNCH EVERY TWO MONTHS.
I WAS NOT EASY TO SELL TO.
I WAS WRONG."

A recollection from Howard P. Sorgen, President of On-Line Software

Personal experience. Can't beat it.

Especially if you've made a few mistakes and you've learned from them.

I have.

It wasn't that I was too smart or too powerful or too good to see all the people who had all that software they were trying to sell.

I was too busy.

I had a business to run so I did what all MIS managers do—leave it to my DP people to pick up a piece here and a piece there and make them fit.

It works.

It works great in the short run. And when you're so busy you can't see beyond the next project, that's the most most companies can, or do, hope for.

But take it from a guy who's been doing this for over 30 years.

Stop.

Sit back.

Relax.

Take a break.

Look around.

Find someone who has more to offer than just a piece of software. Someone who can help. Someone you can talk to, every day if you need to.

I did. I liked the way it felt, thought other DP managers would feel the same way, and that's why I'm at On-Line Software today.

By the way, my number's (201) 592-0009 and my extension is 2823. Call if I can help.

Howard Sorgen

Before You Buy Another P
Ask Yourself a Simple

North Africa...U.S. paratroopers on the way to their next mission. (Credit: International News Photos)

The time has come for the big software rout. Little companies acquire big companies and big companies fight to hold their position against an onslaught of corporate raiders, disenchanted financial advisors and a skeptical Wall Street.

Those brilliant boys who sat in backrooms and changed the world can no longer afford to bring their product to a more complicated and more expensive market.

What used to be a craft is now a business, and that business is in turmoil. What used to be an innovative, entrepreneurial undertaking has been overwhelmed by a cover-your-butt mentality.

Rightly so.

Where will you be, who will own the software that runs *your* machines when the dust settles?

Systems software purchases are commitments. Commitments that ask *your* people to generate *your* work to satisfy *your* customers, a certain way for a very long time.

Changing that is rarely easy, always expensive.

■ WHAT HAPPENS WHEN YOUR FAVORITE LITTLE SOFTWARE COMPANY GETS EATEN UP BY SOMEONE YOU REALLY DON'T LIKE?

Pick up The Boston Globe, The Wall Street Journal, Business Week and you've got an arm load of software mergers, purges and shake-ups.

Some good. Some bad.

All affect you.

iece of Systems Software, Question. Is it Safe?

With a growth rate as high as 75%, constant new releases and several major acquisitions, On-Line Software started as, and remains, an exploding star.

In that atmosphere any company must work hard, very hard to keep its feet on the ground. Because all too often, asking a business partner to share in your glory carries an unspoken and unintended commitment to ride out your downfall.

It's a hard lesson, a lesson best learned from IBM—who we've mentioned many times before and we'll mention many times again. It's okay to take chances, it's even necessary to take risks, but never, ever pass them on to your customers.

■ BE CAREFUL WHO YOU BUY YOUR PROBLEMS FROM.

Safe. Is it safe? Is it a safe buy?

Safety is where it has always been.

In numbers.

In stability.

In support.

In growth.

In training.

In specialization.

In finding the high ground and holding it.

In an industry too often trying to be all things to all people, On-Line Software passes up many opportunities in order to solidify one position, to be authorities, authorities in IBM systems software.

In an industry whose raison d'etre is to sell more and more product, On-Line Software started by offering consulting, and now trains more people in the intricacies of IBM systems software than most anyone. In an industry in the midst of a shake out, we do the shaking, impervious to hostile takeover.

■ SO HOW DO YOU ELIMINATE THE INHERENT RISKS IN SOFTWARE PURCHASES?

Thirty-day trials help. But if you can feel secure with just a month's experience under your belt, you're better than most.

Look for specialization in IBM, especially in CICS and DB2.

Look for a company with a history of a new release for every product every year.

Look for tech support.

Look for educational offerings not only where the product is sold, but in the field where it is used.

Ask consultants and value added resellers which products they use to make their jobs easier.

Look for a company that asks smart questions.

Look for a company that comes to you.

Most of all, don't jump before you know what's down below.

THE NEW DEAL.

Things change.

In this business that's the name of the game.

So what seemed like a great decision—what was a great decision—a year ago can often turn into a worthless piece of software when your hardware changes or your operating system changes or your business changes or you just change your mind.

Until now all you could do was bite the bullet and wait for next year's budget.

That's all changed.

If you got it from On-Line Software, then just send it back.

Here's how it works.

License any On-Line Software product.

Take maintenance.

Use it.

Then, six months later—or six years later—if you're through with it or just don't need it or just want something else, trade it in, dollar for dollar, for another On-Line Software product.

That's it.

If you're looking for the fine print, there is none.

If it's an idea that sounds right for you, give me a call for the details.

Jack Berdy

Jack Berdy, Chairman and CEO

P.S. I want to ask a favor—a small one, I hope.

As far as we know right now, no other company offers a guarantee that even comes close. In fact, as far as we know, no other systems software company has any extended guarantee at all.

That too will change. Sooner or later, they'll all have to do it just to keep up.

So the first time you hear some software sales rep going on about his company's great unconditional guarantee, please remember that it all started right here.

Thanks.

The DP Ass

The Homefront...Dedicated workers are the backbone of any modern operation. (Credit: UPI)

■ If you're over 30 you probably remember the ads on the inside of match book covers, "Learn To Be A Key Punch Operator And Enter The Exciting World Of Computers."

Now, with 1990 less than 500 days away, it all sounds so naive, doesn't it?

Well, that's the way a lot of people got started. It beat working in the mill or answering the phone all day. To be fair it still does.

But the glamour's gone.

Today there are 900,000 DP professionals in the United States.

There's only one problem. We need almost 2,000,000 more. We measure backlog not in days or months but in years. Years!

Ten years ago, no one ever thought that computer programming would become a white collar assembly line.

So, the exciting world of computers has come down to one thing—a lot of hard work.

Programmers never seem to get ahead.
They never get caught up.
Their job will never be finished.
There's always more to do.
Sort of like working in the mill.

■ TELL YOUR DP MANAGER SHE JUST NEEDS TO WORK HARDER AND GUESS WHAT SHE'LL SAY.

Put a machine that does its work in milliseconds in the same room with people who are inexorably tied to the cycles of the sun and moon and seasons, and something has to give.

Inevitably, it's the people.

Frustration, anxiety and desperation build until writing an application program, essentially a creative undertaking, turns into a crank-it-out-and-shut-them-up task.

Everyone—except the computer—loses.

There's much more to be gained from making application development easier than just making it

embly Line.

faster. Taking out the drudgery, the rote, the repetition, leaves room for reflection, time for inspired daydreaming—essential activities that are at best fond memories for most programmers.

UFO, VERIFY, InterTest, IntelaGen, DataVantage, and now, most of all, CasePac help bring it back. They buy you time.

Time, we hope, not to do things faster, but to do them better.

■ *HI-TECH INTERCOURSE.*

Applications programmers are much like God, or Dr. Frankenstein, depending on the outcome.

They conceive a program.

It's born.

It lives.

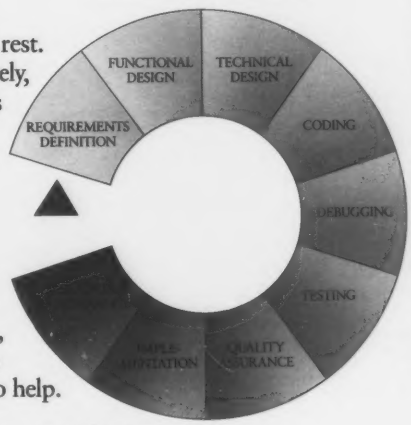
It grows.

It ages.

It is laid to rest.

Appropriately, the whole process is called a lifecycle.

THE APPLICATION DEVELOPMENT LIFECYCLE



No matter where you are in that lifecycle, from the first gleam in your eye to resurrecting a geriatric program, there's an On-Line Software product to help.

■ *CASEPAC.™ THE GENE POOL.*

CasePac.* Automated software development for DB2 with a powerful data dictionary.

CasePac gives you the tools to automate design and modeling functions. But most important, it stores information about your designs, models and data flow diagrams—everything it takes to build an application—in one central place where everyone can get to it. It not only stores information about current projects, it stores information about existing applications, too. So everything is consistent. Everyone works with the same definitions and standards.

Because nothing lasts forever—although some applications programs seem to—CasePac also helps you with that nasty little chore called maintenance.

Once the creator is gone—and most creator-types don't leave good notes—it falls upon the meek who have inherited the mess to figure out how it was put together and keep it going as long as possible.

With CasePac, the records are there. Records that can be used to fix what you've got. Or grow another.

CasePac. For DB2, it's where life begins.

■ *UFO.® THE BREATH OF LIFE.*

Go from prototype to finished application in record time with the most resource-efficient development system on the market. It's the most flexible, too, with full portability across CICS, CMS, TSO—even the 9370.

UFO makes it easy. Many applications can be built using menus alone, with the help of pre-programmed logic and built-in functions. For even more speed, you get automatic data base access—including DB2 and SQL—as well as an active data dictionary that makes maintenance a breeze.

■ *INTELAGEN.™ CHAIN OF COMMAND.*

Instead of writing COBOL or PL/1 code line by line, step by step, let IntelaGen do it for you.

IntelaGen generates stand-alone COBOL or PL/1 code from simple commands that cover all structured programming and computational functions.

It accepts either IntelaGen or COBOL commands, so novices can learn as they go. When they do make a mistake—and they will—an on-line syntax editor tells them right away, making IntelaGen the code generator that's easy to use even if you don't know how.

■ *INTERTEST® AND DATAVANTAGE.™ PHYSICAL FITNESS.*

InterTest is the number one CICS applications debugging and testing tool in the world.

With good reason.

It prevents all application errors known to CICS—and does it with such ease and grace, it makes one of your most grinding jobs seem a snap.

For IMS and DL/1 data bases, DataVantage automatically creates an accurate subset for testing. There's no need for manual coding since DataVantage does all the heavy labor—from query and updating to comparing data bases before and after testing.

■ *VERIFY.® RUNNING THE GAUNTLET.*

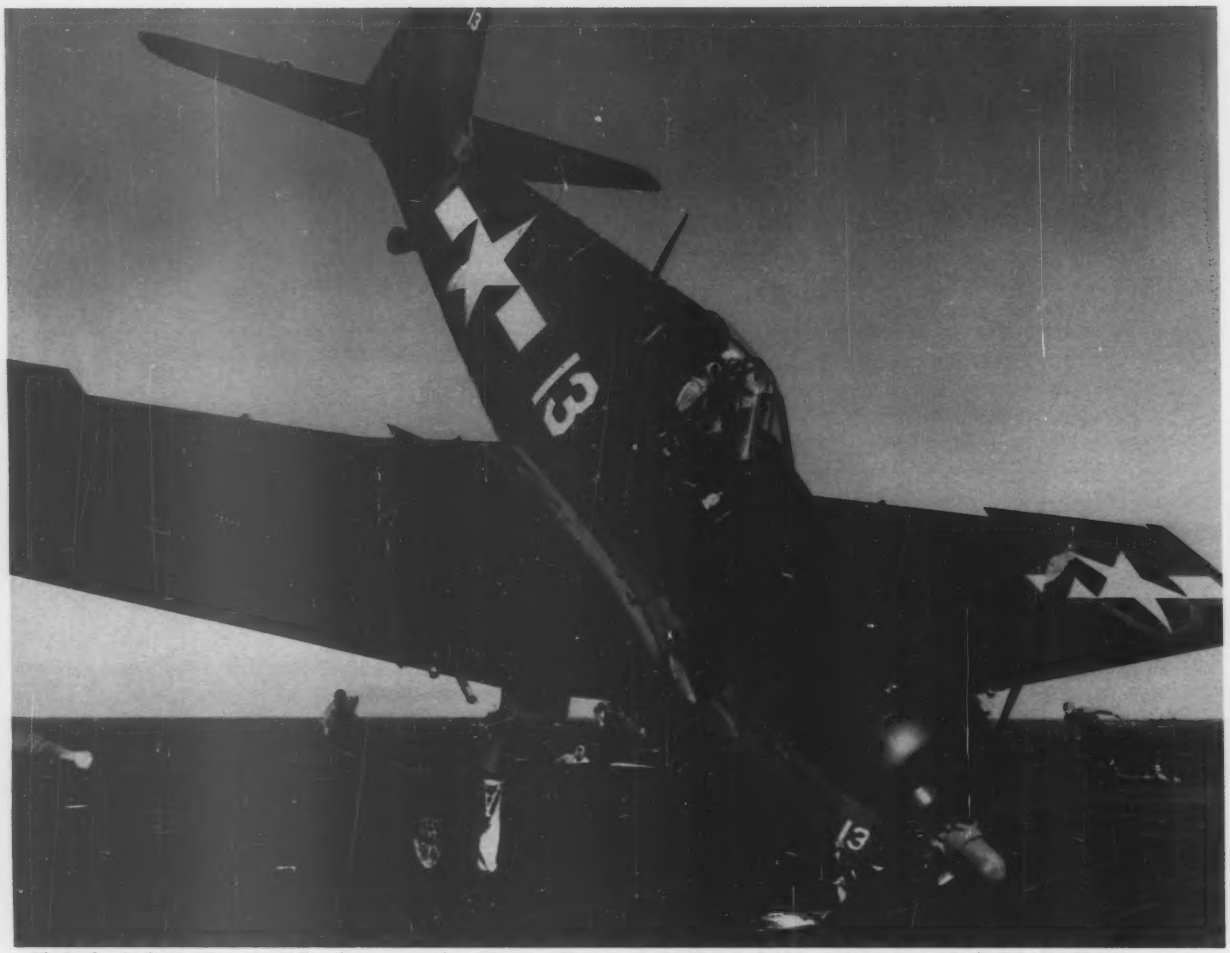
VERIFY determines if your program will wimp out when the going gets tough.

It lets you see the real impact of changes you've made to your programs *before* you get production system "surprises." VERIFY is an automated CICS quality assurance tool that handles the full gamut of testing needs. It tells you if your applications will work as expected after changes are made to your program code, CICS releases, operating systems, hardware, or transaction load.

In short, if anything changes, VERIFY can test it.

**CasePac is a joint venture with TATA CONSULTANCY SERVICES.*

How Much Trouble Wou Unplugged Your Mainf



The Pacific...Lucky 13, a Grumman Hellcat, forces commanders and seamen alike to ponder the dilemma of a unit out of commission. (Credit: U.S. Navy Photo)

■ Yes, everyone knows that computers don't go down for a whole day anymore.

Or do they?

Would you admit it if it happened to you?

So let's forget about a day.

How about an hour?

Or, if you're an "average" MIS Department spending an "average" of over $5,000,000 a year which is an "average" of almost $100 a minute, well—you get the point.

■ OPERATIONS IS EVERYTHING.

If you're willing to pay the price there are a few mainframe manufacturers who will sell you two computers instead of one, so if one goes down you've got a backup.

Sort of like carrying a spare set of batteries for your pocket calculator.

Whether or not you need fault tolerant or faultless computers, the simple fact is computers do go down.

Often. Regularly.

Usually during your prime shift, right in the middle of your business day—and these days you don't have a business day if your mainframe isn't on-line. Usually it's a programming or software problem.

Yes, we said it. Believe what you like, but there's

ld You Be In If Someone rame For Just One Day?

no such thing as faultless software. Or faultless people.

There are simply no magic potions or secret formulas or revolutionary programs that will bail your rear end out at 2 a.m. when your batch programmers are fighting with CICS for a file.

There are no answers.

There is help.

■ *STABILIZE® SHELL SHOCK.*

CICS programs are born with the jitters.

STABILIZE is like pumping 25 milligrams of lidocaine into the system every time it gets jumpy.

It prevents crashes and dynamically repairs damage caused by corruption of CICS management modules and storage chains, systems or application loops, and all sorts of systems abends. And with its unique InterTest "handshake", errors won't recur.

■ *TOOLSET-DB2.™ LIBERATE YOURSELF.*

Bogged down in the really boring, repetitious parts of your job?

TOOLSET-DB2 is a complete set of tools that automates and speeds many of your routine tasks such as writing SQL statements.

With TOOLSET-DB2, you won't have to issue complex catalog queries over and over again to determine object definitions and relationships.

You won't have to do special programming to get DB2 data into a physical sequential data set—or spend long hours setting and removing DB2 security.

■ *CICS CENTRAL.™ SEE THE WORLD FROM THE COMFORT OF YOUR CHAIR.*

CICS Central is a powerful data center tool that lets you operate multiple local and remote CICS regions from one central location.

With CICS Central you can anticipate and correct CICS operational problems *before* your users notice them. All CICS and VTAM messages can be filtered, color-coded, and replied to automatically.

How's that for comfort?

■ *OMNIGUARD.® COMPUTER FRAUD? ADMIT IT! IT'S EXCITING!*

How about whoever it was that stole 16 million taxpayer records from Revenue Canada? Hah! Got even with them, didn't he? Our favorite is the disgruntled CFO who held his employer's files hostage and demanded a ransom when he didn't get an expected pay raise.

Love it! Love it! Love it!

Until it happens to you.

Then it hurts. Bad.

OMNIGUARD is the most comprehensive software security system available anywhere at any price.

Need we say more?

■ *DADS.™ WHAT HAPPENS WHEN YOU ASK YOUR MAINFRAME FOR A SIMPLE FAVOR AND IT TELLS YOU TO TAKE A HIKE?*

"Files Not Available." "Datasets In Use."

It's almost dawn. It's not funny.

You need to update your CICS files and some batch programmer has them. Who's in charge here anyway? DADS is a file and application control system for CICS/MVS that performs dynamic allocation/deallocation and automatic enabling/disabling of transactions and programs, thus allowing 24 hour CICS availability.

True, you may not need it right now.

But then again, it's not 4 a.m.

■ *VSUM.™ THREE MILLION DOLLARS FOR A MAINFRAME. FIVE MILLION FOR DISK SPACE. FILL THEM UP, THEN BUY MORE?*

Let's say you need to add 100,000 new customers.

Everything's full so where you gonna put em? Especially since all of your programmers are hiding away a little storage space "just in case they need it".

VSUM can figure out how much space you'll need, when you'll need it, and where to find it—before you're in trouble.

It saves time. It saves disk space.

It could even save the price of a new controller.

■ *FILESAVE.™ SAVE YOUR EMPLOYEES FROM A LIFE OF DRUDGERY.*

If you worked your way up through the ranks, once upon a time you probably had to recreate lost or damaged files. And you probably hadn't done the necessary backup. And you probably got into trouble.

And the same thing is probably going on in your DP department right now.

FILESAVE can keep you out of trouble by reducing your backup frequency, automating the dataset recovery process and providing fast and accurate forward and backward recovery of VSAM datasets. Most of all, it does the jobs no one else wants to do.

How to Turn Data

Location Classified…Six men from an American photo reconnaissance unit sprawl over the French landscape. (Credit: Bettmann/Black Star)

Into Information.

■ Lest we forget, all those impressive numbers, all those binary figures, all those bits and bytes and data bases that you took so much time to collect and spent so many millions of dollars to input and output and sort and store are absolutely worthless to the average branch manager in Poughkeepsie who isn't meeting his or her sales goals.

And you surely remember that meeting one's sales goals, or productivity goals or quality goals is what most businesses are all about.

Not bits.

Not bytes.

Not data.

Business is about information, and information and data are not the same.

■ *THE NEW RAMIS.®*
WHAT YOU DON'T KNOW CAN'T HURT YOU.

Converting data into information is easy, if you know how to access a mainframe and you're not already 3 months behind with all your other work.

There are alternatives.

Take the new RAMIS Information System for example.

According to Rick Holtmeier, our Executive Vice President, pulling a management report with RAMIS is so easy even his secretary learned to do it in 10 minutes.

According to Rick's secretary, it's so easy even he learned to do it in an hour so now she doesn't have to bother.

Okay, let's go back to the guy in Poughkeepsie.

He doesn't know how to access a mainframe —let's face it, you don't want him to know how to *really* access your mainframe. He doesn't know how to write a macro. He doesn't know procedural syntax from his dear Aunt Maude.

He does, however, have a commanding knowledge of the alphabet. With the RAMIS report writer that's all it takes.

For instance, if he wants to know the total revenue for each product purchased by Acme Widget in the fourth quarter of last year, he simply types—using as many or as few fingers as he chooses—Show me the total revenue for each product purchased by Acme Widget in the fourth quarter of last year.

RAMIS then displays a table listing each product and the total revenue from Acme Widget during the fourth quarter of last year. What could be simpler?

Charts and graphs could be simpler.

RAMIS does that too, with only a few additional keystrokes.

For the really inquisitive, RAMIS, RAMIS/PC Workstation™ and RAMIS English™ have pop-up menus and non-procedural syntax that provide external data selection and sequencing options, and let your man in Poughkeepsie manipulate data with summary operators, temporary fields, totals, and basic statistical operations.

It's just that easy or just that hard, depending on how you want to play it.

■ *BULLETIN.™*
WHEN IT ABSOLUTELY, POSITIVELY HAS TO BE THERE AND YOU DON'T HAVE ALL NIGHT.

Which is more unreliable, the U.S. Mail or your own internal routing service? Either way, if you haven't missed an important message in the last month, count your lucky stars. Business *is* communications, and BULLETIN lets you take charge.

With BULLETIN you can automatically send, receive, track and file everything from a hundred page business plan to a top secret dinner invitation to the hunk or hunkette across the hall. You know who has received your memos and who hasn't and who has viewed them and who didn't bother.

Getting people to act on them is a problem we haven't yet solved.

■ *OMNILINK.™*
THE GREAT COMMUNICATOR.

Anybody can make micros and mainframes talk to each other. OMNILINK lets them communicate.

If you've looked at PC to mainframe links, you've probably come away with a few questions.

Like, how do I learn all those computer languages? How do I handle security? How do I control the information flow? How do I talk to other PC users? How do I reformat data? And on and on and on.

Get OMNILINK.

Of course, we could go on and on and on.

Low Tech Solutions to

England…High spirits and camaraderie are vital ingredients in making pilots out of men. (Credit: Reuters/Bettmann)

High Tech Problems.

■ Running 50 or 100 DP departments all over the world is not unlike maintaining a small army. Hardware and supplies. Logistics and communications.

And most of all, of course, people.

If you're one of the very biggest companies in the world and you need a systems integrator, you're probably going to call IBM or EDS or Arthur Andersen. And you'd probably be right to do so.

(So much for the free publicity for our competitors.)

What if you're not one of the biggest? Or, more likely, what if you need help on the departmental level?

What if you need an elite troop who can move in, assess the situation and do the job quick, without carrying around a lot of overhead?

Consider On-Line Software.

Especially if you need technical consulting.

Definitely if you're moving into DB2.

Always if you're CICS.

On-Line Software started as a technical consulting company for CICS in 1969.

Back then CICS was the really "sophisticated" end of the business and On-Line Software ruled the roost.

To some extent it still is and we still do.

But now there are a hundred companies who do it for less. Still, our old customers keep on coming back and new ones walk through the door every day.

Perhaps that's because—as we've said throughout this treatise—things are not as simple as they used to be.

Who needs just a CICS consultant anymore?

Or just a batch consultant?

Or just a DB2 programmer?

Or just a piece of software?

Nowadays, in this business, if you're just anything, you're nothing.

That's why we've expanded our consulting services, integrating them with software and supporting them with education and training so that it's sometimes hard to tell where one begins and the other stops.

However—and this is important—our consultants and educators don't sell software.

Objectivity, especially if you're a consultant, is your life's blood.

Sure, our consultants use our products whenever it serves their needs. And sure, they miss a lot of opportunities to sell a lot of software. But every person who walks through your door is given one directive: do the best job he can with allegiance to no supplier.

It costs a little business.

It keeps a lot of friends.

■ PLANNING A WELL RUN DP OPERATION IS LIKE REHEARSING FOR HAMLET.

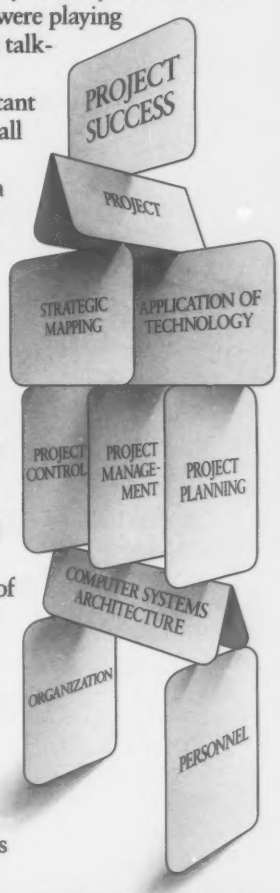
Remember your high school play? After you'd learned all your lines—or learnt if you were playing Shakespeare—the coach started talking about plot points.

Those were the important parts, the parts where most of all you couldn't mess up. If you messed up at a plot point then everything else messed up and the audience laughed. It's just the same with DP planning, only if you mess up nobody thinks it's funny. Instead of key plot points, our management consulting people call them "csf's" or critical success factors. In other words, "Those areas where things must go right for business to flourish."

Remove any block and it all falls down.

By analyzing over 150 of these csf's you can predict the chances that your project will be done on time and on budget—or done at all for that matter—before you begin.

Since, according to some industry reports, half of all projects begun are aborted before they're finished, it keeps your business from being just another crapshoot.



CRITICAL SUCCESS FACTORS

■ THE SMARTER THE TROOPS THE SMARTER THE GENERALS.

No one famous said that.

But they should have.

Each year On-Line Software teaches over 13,000 students—your employees—how to write your programs and operate your systems, in 750 classes taught by 32 full time instructors at ongoing offerings in New York, Atlanta, Boston, LA, Chicago, Detroit, Denver, Hartford, Princeton, Cleveland, Washington, Houston, San Francisco, London and various cities throughout Canada and Europe.

If you're somewhere we're not, we'll come to you.

Asked to brag a bit, John Morbach, Senior Vice President of Education, says, "You name 'em, we've trained 98% of 'em."

We train IBM.

We train EDS.

We train McDonnell Douglas.

We've surely trained someone in your own shop.

We offer classes in everything from applications programming to systems internals.

Our most popular courses are CICS Internals and CICS Command Level.

Our hardest class is VTAM, so hard in fact that when we discovered even VTAM professionals were having trouble we softened up and started "Introduction to VTAM".

If DB2 is in your future, we have four classes covering concepts, design, applications programming and systems, and we have them now.

In most cases, the instructors are the same people who developed the class, so students are never stuck with a teacher and a book and little else to go on.

Of course, all products, especially On-Line Software products, are always taught on the latest releases.

WHAT DO YOU DO WITH AN EXTRA $3 BILLION AND NOWHERE TO PUT IT?

Here's the lowdown.

Pennzoil had an extra three billion, cash money. (We won't mention where they got it.)

They needed to get it from New York to Dallas, Fed to Fed.

A number of banks wired the money to Manny Hanny.

Manny Hanny wired it to the Fed in NYC.

NYC wired it to Dallas.

The whole thing came down in less than 12 minutes.

It was the largest transaction in the history of the world.

On-Line Software consultants helped build the systems that did it.

And nobody lost a dime.

■ "WE TRAIN OUR PEOPLE TO BE NICE EVEN WHEN YOU'RE NOT."

Debbie Gregory, Assistant Vice President of Marketing Services

You just can't blame it on the computer anymore, can you?

Even if it's true, people, especially your customers, just don't go for it.

They rant.

They rave.

They scream.

They shout.

They curse your name and hang up and take their business elsewhere, if they can.

So what do you do?

You call us.

You rant.

You rave.

You scream.

You shout.

And you take your business elsewhere if you can.

We understand. And we try to do something about it.

Like having a hot line for all of our products.

Like connecting you with a technician right away.

Like getting you a new tape overnight.

Like answering a bookkeeping question the same day.

Like putting you directly in touch with the vice president in charge.

If that's not enough, call me.

Debra Gregory

IBM is a registered trademark of International Business Machines.
EDS is a registered trademark of Electronic Data Systems.

D-Day.

■ It's not over.

Not yet.

And if you believe the newspapers, the magazines, the trade press, it's about to start all over again.

There's a guy in California with a goatee, a Hawaiian shirt and patent leather shoes working on a process to produce chips more efficiently—there's always a guy in California working on a process to produce chips more efficiently—but this time the fellow says they'll be a thousand times easier to make and ten thousand times more powerful.

The experts say he knows what he's talking about.

He expects to be on the market in 1993.

IBM is in on it. So is everybody who is anybody in the mainframe business.

So, it's not over.

The explosion of growth and innovation and technology that created the PC market and taught the whole world how to process data is about to start all over again.

This time the noise may not seem as loud but the impact will certainly be felt.

This time it's going to hit mainframes.

Hard.

In their corporate message, Big Blue asks you to look at the bigger picture.

We respectfully suggest you be a part of it. A part of a marriage, a partnership, a relationship—a strategic alliance intended to join you not only with IBM but with the systems software it takes to make the whole thing run.

There is no answer. Only help.

Help starts here.

Please send more information about On-Line Software's:

☐ Products _____
☐ Consulting Services
☐ Educational Services

Fill in product name(s)

☐ Please have a representative call.

Name, Title _____

Company _____

Address _____

City, State, Zip _____

Telephone _____

CWASAU8

FOR FASTEST RESPONSE CALL TOLL FREE 1-800-642-0177.

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COMPANY	PRODUCT	HARDWARE PLATFORMS	SOFTWARE PLATFORMS	TOOL KIT/WORKBENCH	METHODOLOGIES SUPPORTED	ANALYSIS AND DESIGN TECHNIQUES SUPPORTED	DIAGRAMS CREATED	SCREEN/REPORT PAINTING	PERMITS SIMULATION OF EXECUTION	AUTOMATIC ON-LINE OR BATCH CODE GENERATION	BUILT-IN PROJECT MANAGEMENT FUNCTIONS	WINDOWING CAPABILITY	SPECIFICATION PROMPTS	INCLUDES MAINFRAME PROJECT DICTIONARY/ DOWNLOAD CAPABILITY	MULTIUSER SUPPORT/METHOD	PRICE
Mentor Graphics Corp. (800) 547-7390	Analyst/RT, Designer, Auditor	VAX, Microvax, Vaxstations	Ultrix, VMS	Tool kit	Yourdon-DeMarco, Ward-Mellor	Structured analysis, structured design, real-time extensions	Data, control flow, structure charts	Both	No	No	None	Yes	Yes	No	Yes	$10,000-$200,000
Meta Systems, Ltd. (313) 663-6027	Meta Systems Tool Set	IBM VM/MVS, PC, PC XT, AT, 3270 PC or compatibles; VAX (VMS, Ultrix), Vaxstation II, Microvax (VMS); Unisys (OS1100); Gould (UTX/32)	Real-time textual, conventional textual, Meta Systems proprietary DBMS	Workbench	Methodology independent	DeMarco	Activity flow, picture reports, extended pictures, process chains, function flow data, network, data flow	No	Yes	Batch	NP	With Quick-spec	Yes	Yes	Yes	$3,500-$55,000
Micro Focus, Inc. (800) 872-6268	Micro Focus Cobol/2 Workbench	IBM PC AT, PS/2 Model 50 and up, 3270 PC or compatibles	Cobol/2	Workbench	Methodology independent	Any	NA	Both	Yes	Both	None	Yes	No	Yes	Yes	$3,280
MRC, Inc. (312) 790-5040	MRC Query series	IBM System/38	RPG III	Workbench	Martin	Datadrivin	Flow charts	Both	Yes	Both	NP	Yes	Yes	Yes	Yes	$16,231
Nastec Corp. (313) 353-3300	Designaid	IBM PCs or compatibles, PS/2 Models 50, 60, 80; AT&T 6300; Compaq III; Kaypro 286; Unisys PCs; Zenith PCs; EDS PCs; VAX/VMS	None	Workbench	Yourdon-DeMarco, Chen, Ward-Mellor	Process, data, real-time modeling	Data flow, entity relationship state transition, flow	Both	Yes	Both	Life Cycle Manager	No	Yes	Yes	Yes	$1,500-$6,900
	Requirements Management Facility (RTrace)	IBM PCs or compatibles, PS/2 Model 50, 60, 80; AT&T 6300; Compaq III; Kaypro 286; Unisys PCs; Zenith PCs; EDS PCs; VAX/VMS	None	Workbench	Yourdon-DeMarco, Chen, Ward-Mellor	Process, data, real-time modeling	Data flow, entity relationship, state transition, flow	Both	Yes	Both	Life Cycle Manager	No	Yes	Yes	Yes	$30,000
	Life Cycle Manager	IBM PCs or compatibles. PS/2 Models 50, 60, 80; AT&T 6300; Compaq III; Kaypro 286; Unisys PCs; Zenith PCs; EDS PCs; VAX/VMS	None	Workbench	Yourdon-DeMarco, Chen, Ward-Mellor	Process, data, real-time modeling	Data flow, entity relationship, state transition, flow	Both	Yes	Both	Life Cycle Manager	No	Yes	Yes	Yes	$3,800
Netron, Inc. (416) 636-8333	Netron/Cap Development Center	IBM PC, PC XT, AT, PS/2, 9370, 4300 series, 3000 series; VAX, Microvax, Vaxstation, Wang VS	Cobol, DB2, Teradata, Ingres, Oracle, IDMS, VAX DBMS, VSAM, RMS, DMS, IMS, CICS, MVS/TSO, VM/CMS, DOS/VSE	Workbench	Rapid prototyping; reusable code, design	Joint application	Frame tree	Both	Yes	Both	Productivity evaluation utility, Cap environment project librarian	Yes	Yes	Yes	Yes	$56,000
On-Line Software International, Inc. (201) 592-0000	Caseps	IBM 370, 3000 series, 4300 series, plug compatibles, 3192G, 3270 PC/G	MVS/XA, VS Cobol II, DB2, PL/1, GDDM with PGM features, TSO/ISPF	Tool kit	Gane-Sarson, Chen, Yourdon-type structured charts	Structured system analysis, entity relationship modeling	Entity relationship, data flow	Screen	No	Both	None	No	No	Yes	Yes	$200,000 (one-time license fee)
Optima, Inc. (313) 240-1888	Brackets	IBM PC, PC XT, AT or compatibles	NA	Tool kit	Warnier-Orr, DSSD[a]	Warnier-Orr, DSSD	Warnier-Orr; structure, flow formats	No	No	Both	None	No	Yes	No	No	NP
	DesignVision	Any that supports Microsoft Windows	None	Tool kit	Methodology independent	Depends on methodology	Depends on methodology	No	No	Both	None	Yes	Yes	Yes	No	NP
	Design-Machine	IBM PC AT or compatibles, PS/2	Integrated data base	Workbench	DSSD	DSSD	DSSD entity, functional; flow; logical data structure	No	No	NA	Maintains trace of completed/ incompleted project activities, traces changes, propagates effect of changes	Yes	Yes	No	No	NP
Oracle Corp. (415) 506-5000	CASE Method, CASE Dicuionary, CASE Graphics	VAX, IBM PCs, mainframes; DG; Sun; Sequent	MS-DOS, VMS, MVS, VM, AOS/VS, Unix	Tool kit	CASE Method, Martin	Entity relationship; functional decompositions; data flow; relational table, event models; file systems; module hierarchy	Entity relationship, function decompositions, matrix diagrammer	NA	No	Both	Yes	Yes	Yes	Yes	Yes	$2,999
Plexus Computers, Inc. (408) 943-9433	Applications Designer	Plexus Extended Data Processing System	C, SQL, MS-DOS, Microsoft Windows	Tool kit	Methodology independent	NA	NA	Screen	No	Both	None	Yes	No	No	Yes	$2,950
Polytron Corp. (800) 547-5500	Polytron Version Control System	IBM PC, PC XT, AT or compatibles; Mac; Microvax II, VAX/VMS	C, Fortran, Pascal, Ada	Tool kit	NA	NA	NA	No	No	NA	None	No	No	No	Yes	$300-$10,500
Programmed Intelligence Corp. (404) 446-8880	Intelligent Query	IBM PC, AT or compatibles; TI-1100, 1300, 1500, Xenix; Altos Xenix; AT&T (Unix) 3B1, 3B2; NCR Tower; Unisys 5000/30/40/50; NBI 510; VAX/VMS, Unix	Cobol, Dbase II, III, III+, Foxbase	Tool kit	Methodology independent	None	None	Report	Yes	No	None	Yes	Yes	No	Yes	$500-$20,000
Promod, Inc. (714) 855-3946	Promod/SA	VAX/VMS, IBM PC or compatibles	Ada, C, Pascal	Tool kit	Yourdon-DeMarco structured analysis	Data flow, data dictionary	Data flow	No	No	Both	Date, time stamps on all data	No	Yes	Yes	Yes	$2,995-$23,960
	Promod/RT	VAX/VMS, IBM PC or compatibles	Ada, C, Pascal	Tool kit	Boeing-Hatley real-time extensions	Control flow, state transition diagrams; control-oriented tables; combined control data requirements dictionary	Control flow, state transition	No	No	Both	Date, time stamps on all data	No	Yes	Yes	Yes	$3,995-$31,960
	Promod/MD	VAX/VMS, IBM PC or compatibles	Ada, C, Pascal	Tool kit	Modular or object-level design, Caine-Farber-Gordon pseudocode	Object-oriented design; data-typing concept for parameters, structures	Module (or object) network drawn automatically by Promod/DC; function network, structure charts	No	No	Both	Date, time stamps on all data	No	Yes	Yes	Yes	$3,495-$27,960
	Pro/Source	VAX/VMS, IBM PC or compatibles	Ada, C, Pascal	Tool kit	Structured programming	NA	NA	No	No	Both	Date, time stamps on all data	No	Yes	Yes	Yes	$1,495-$4,995
	Procap	VAX/VMS, IBM PC or compatibles	Ada, C, Pascal	Tool kit	NA	Design abstractions, code refinement techniques via language sensitive editor	Action, graphical aids drawn automatically by Procap	No	No	Both	Date, time stamps on all data	No	Yes	Yes	Yes	$995-$7,995

10 Looking at CASE tools? Ask these 10 tough questions before you buy.

1 Can we get all the tools we need?

Most CASE tools handle only isolated parts of the development process. These tools can improve productivity to some extent. But as long as other steps must be done manually or you must rekey information to move between lifecycle stages, you lose many of the benefits of capturing information with the tool. To get the full advantage of CASE technology, it's best to have tools for every stage of application development.

KnowledgeWare's tool set covers the complete lifecycle – from planning to the generation of executable COBOL code.

2 Can we get just the tools we want?

With some CASE tools, you may be required to buy more capabilities than you need. That's because some vendors have locked together tools for discrete development steps. So if different people do analysis and design, for example, you may be forced to provide everyone with a tool that does both.

KnowledgeWare's CASE solution is modular with separate tools for planning, analysis, design, and code generation that can work together…or alone. KnowledgeWare is unique in its ability to offer both the integration of a one-vendor solution and the flexibility of product modularity. So you aren't forced to buy more than you need.

3 How well are the tools integrated?

Most CASE tool vendors offer tools that aren't well integrated with each other. But if you can't easily pass information from one tool to another, much of the expected increase in productivity and system quality will be lost.

KnowledgeWare's CASE solution is integrated to allow information to flow naturally from planning through detailed design and system construction. Each tool contributes to a growing body of knowledge stored in the Encyclopedia. As information is updated by one tool, the change and its affects are reflected in all other tools that use that information.

4 How are diagrams stored in the tools?

The real value of diagrams in application development is the meaning behind those diagrams. A tool that stores the meaning of diagrams has numerous advantages over one that merely stores pictures of diagrams.

KnowledgeWare tools use artificial intelligence technology to store the *meaning* of diagrams, not just the graphical representation. The Knowledge Coordinator™ translates your diagrams into Encyclopedia information that can drive the system's construction. And the Knowledge Coordinator can take the information from any one diagram and automatically redraw it using a number of other diagramming techniques. This allows you to present diagrams in a form that best communicates ideas to each particular audience. And it saves countless hours of time.

5 Will the tools work with our current methodology?

Many CASE tool sets are tied to a specific methodology. To use them, you have to change your methodology to conform to the requirements of the tools. But you shouldn't have to learn a totally new methodology in order to get the advantages of CASE.

KnowledgeWare's CASE solution is not linked to a specific methodology. Nor should it be thought of as a replacement for your company's existing methodologies and development techniques. KnowledgeWare's tools provide an environment where engineering-like discipline is used to integrate existing approaches. So you can use any of today's popular methodologies, and capitalize on the experience you already have in your shop.

6 Can we introduce the tools at any point in the development cycle?

Some CASE tools require you to follow a rigid development process step by step – even if you wouldn't normally use some of these steps. For example, if you want to do some design before you get into system analysis, these tools may not allow it. Some force you to start using the CASE tool in one stage before you can move on to another.

Each of KnowledgeWare's CASE tools is tied to the others through a common Encyclopedia. And you aren't forced into a strict series of development stages. You can start wherever you like and even work backward through much of the tool set. For example, if you're in the design stage of an application right now, you can enter your current work into our tools at this point. You can work back through analysis if you choose and make use of the information collected in design. Many companies like to be able to "pilot" a particular phase of a development project to demonstrate the value of CASE technology. Our tools allow that.

7 Can the tools help improve system quality?

Some of the tools available today are simply diagramming aids. In order to improve the quality of applications, the tools should be able to check for consistency and correctness.

KnowledgeWare's tools use artificial intelligence technology to provide *real-time* checking of consistency and correctness of diagrams as they are created. This ensures the diagrams you draw represent information systems that can actually be constructed. You can concentrate on system concepts rather than structure details. Plus, it catches errors early in the development process, where they are far less costly to fix.

8 How friendly is the user interface?

The CASE tools you select should communicate ideas as clearly as possible. And the tools should make it easy for users to manipulate and modify these ideas. Unfortunately, most CASE tools have not kept pace with the latest advances in user interface technology.

KnowledgeWare's CASE tools use windows to allow you to view many diagrams and definitions at the same time. And to make it easy to tell diagrams apart at a glance, each can be displayed in a different color. You can zoom in on a particular diagram or nest several on the screen. And if you want to focus on a particular aspect of the application, you can mask out distracting elements in the diagram or highlight the path of information through a number of diagrams. Our tools are mouse-driven and have pull-down menus, making them fun and easy to use.

9 Can we exchange data with other software we already have?

Many CASE tools say you can do this. But most tools only make information from their tool available through specific interfaces to other products. The CASE vendor may not even provide an interface to your particular software. The tools should also let you bring in information captured in other software tools. Many CASE tools cannot support that.

KnowledgeWare products provide flexible import/export capabilities. This type of facility ensures you can exchange information with your existing database management systems, fourth generation languages (4GLs), data dictionaries, etc. Our tools help you take full advantage of all software in your shop.

10 Is there a plan for future advances?

Ask CASE vendors about their future plans. If they can't give you definite answers, there may be problems with expansion of their existing products. They may lack the underlying architecture to meet your demands for better products in the future.

KnowledgeWare has been following a master plan since its beginnings in 1979. We will continue to add even more capabilities to our current tool set. More powerful commands, even more diagramming techniques, and more user customizable features. Work is now under way to take full advantage of emerging technology such as IBM's SAA, OS/2, and Presentation Manager. This will lead to faster and even more powerful tools in the future. Software is our *only* business.

A comprehensive CASE solution is as close as your phone

Naturally there's much more to learn about the extensive capabilities of KnowledgeWare's CASE tool set. For more detailed information, **call 1-800-338-4130 toll-free** (in Georgia, call 404/231-8575). And if you want to talk to one of our representatives, just ask when you call.

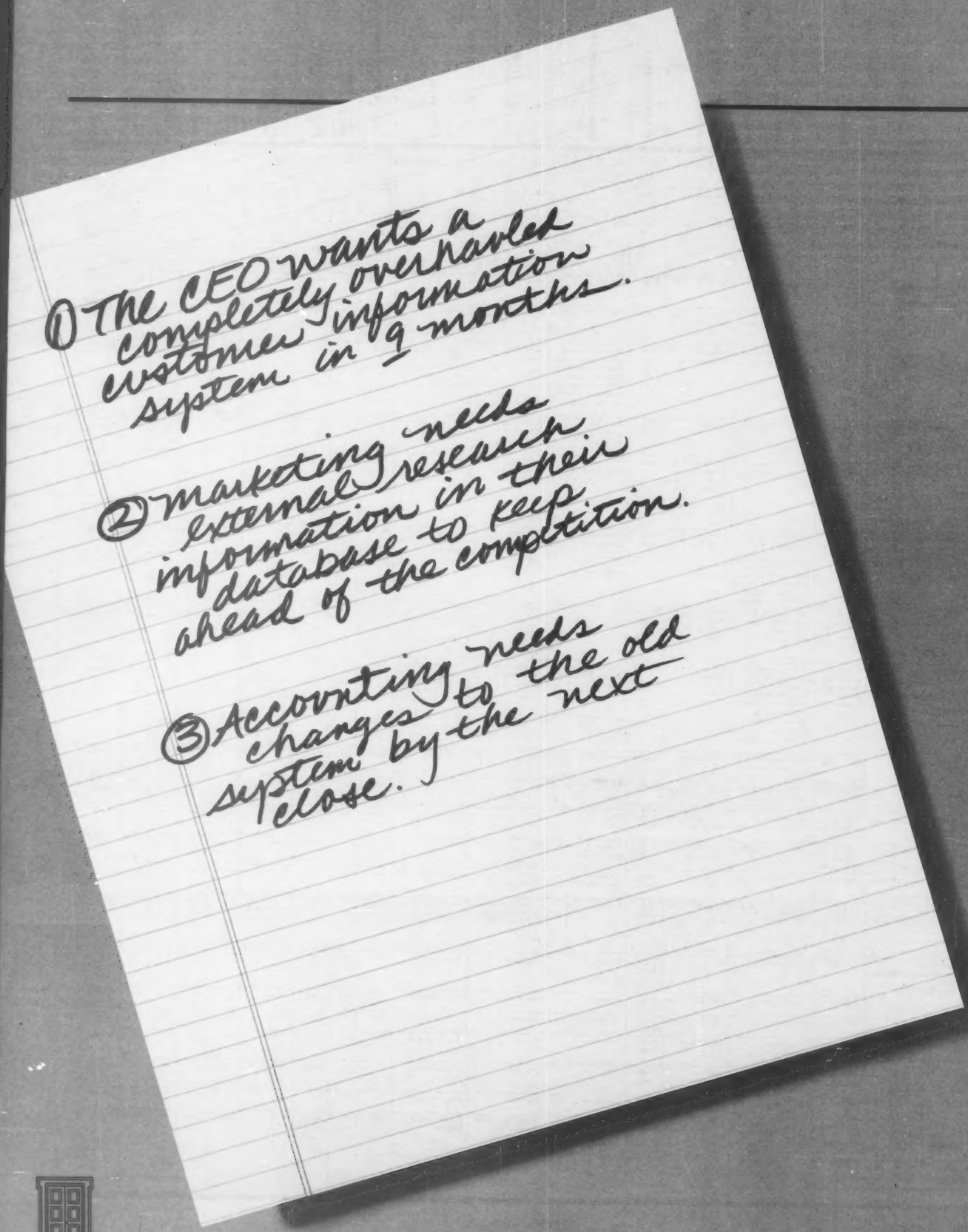
KnowledgeWare

The World's Most Comprehensive CASE Tool Set

KnowledgeWare, Inc.
3340 Peachtree Rd. N.E., Suite 1100
Atlanta, Georgia 30026.

COMPANY	PRODUCT	HARDWARE PLATFORMS	SOFTWARE PLATFORMS	TOOL KIT/WORKBENCH	METHODOLOGIES SUPPORTED	ANALYSIS AND DESIGN TECHNIQUES SUPPORTED	DIAGRAMS CREATED	SCREEN/REPORT PAINTING	PERMITS SIMULATION OF EXECUTION	AUTOMATIC ON-LINE OR BATCH CODE GENERATION	BUILT-IN PROJECT PLANAGEMENT FUNCTIONS	WINDOWING CAPABILITY	SPECIFICATION PROMPTS	INCLUDES MAINFRAME PROJECT DICTIONARY/ DOWNLOAD CAPABILITY	MULTIUSER SUPPORT/METHOD	PRICE
Promod, Inc. **(714) 855-3048**	ReSource	VAX/VMS, IBM PC or compatibles	Ada, C, Pascal	Tool kit	NA	NA	Through to Promod/ MD	No	No	Both	Date, time stamps on all data	No	Yes	Yes	Yes	$1,495-$11,995
	Promod/DC	VAX/VMS, IBM PC or compatibles	Ada, C, Pascal	Tool kit	NA	NA	NA	No	No	Both	Date, time stamps on all data	No	Yes	Yes	Yes	$500-$1,000
	Promod/ TMS	VAX/VMS, IBM PC or compatibles	Ada, C, Pascal	Tool kit	NA	NA	NA	No	No	Both	Date, time stamps on all data	No	Yes	Yes	Yes	$500-$4,000
	Promod/CM	VAX/VMS, IBM PC or compatibles	Ada, C, Pascal	Tool kit	NA	NA	NA	No	No	Both	Date, time stamps on all data	No	Yes	Yes	Yes	$1,000-$4,000
Rand Information Systems, Inc. **(415) 769-5800**	Rand Development	IBM mainframes running MVS	Cobol	Workbench	NA	NA	NA	Screen	Yes	Both	None	Yes	No	Yes	Yes	$115,000
Rational **(408) 496-3600**	Rational R1000 Development System	Rational R1000 Models 10, 20, 40, Rational Design Facility	Rational Environment, Ada	Tool kit	Object-oriented design	NA	None	Both	Yes	Both	NP	Yes	Yes	No	Yes	$295,000-$795,000
Ready Systems Corp. **(800) 235-1349**	CardTools	VAX 8000, 700 series, Microvax 3000 series, Vaxstation	Language independent	Workbench	Structured analysis, design, programming; object-oriented design; top-down stepwise refinement; functional decomposition; strong data, abstract data typing	Methodology dependent	Control, task map; data, control flow map; PDL, real-time performance verification	Both	No	NA	No	Yes	Yes	Yes	Yes	$10,000-$75,000
Reasoning Systems, Inc. **(415) 494-6201**	Refine	Sun, VAX, Symbolic	C, LISP	Workbench	Executable specification, rapid prototyping	Program transformation, interactive refinement	Data flow, call-trees	Both	Yes	Both	Development history, full data base query series	Yes	Yes	No	Yes	$10,000-$60,000
Sage Software, Inc. **(301) 230-3200**	APS Development Center	IBM mainframes, PC XT, AT or compatibles	VS Cobol, VS Cobol II, IBM Cobol/II, Micro Focus Cobol, IMS/DB, VSAM, IDMS/DB, DB2, IDB, Micro Focus IMS/DB, DL/1, V-ISAM	Tool kit	Methodology independent	Universal import/export capability	NA	Both	Yes	Both	None	Yes	Yes	Yes	Yes	$3,000-$300,000
Scandura Intelligent Systems **(215) 664-1207**	Predac	IBM PC AT or compatibles	Pascal, C, ADA, Cobol, PL/1	Workbench	Methodology independent	Depends on Methodology	Top-down refinement, high-level flow form	Both	Yes	Batch	None	Yes	Yes	No	Yes	$12,000
Softlab, Inc. **(415) 957-9175**	Maestro	Microvax II; Motorola 4000, 5000; Tandem, Honeywell Bull, Unisys mainframes; IBM PC XT, AT or compatibles	Language independent	Both	Methodology independent	Any	NA	Both	No	Both	Progress analysis evaluation, scheduling cost control	Yes	No	No	Yes	$200,000 (for 32 users)
Software AG of North America, Inc. **(703) 860-5050 (U.S.);** **(819) 623-5020 (Canada)**	Natural Construct	VAX, IBM 370, 4300 series, 3000 series, 9370 series or compatibles	Adabas, Natural, VSAM, DL/1, DB2, CICS, TGSO, IMS, Complete	Workbench	NA	NA	NA	Both	Yes	On-line	NA	Yes	Yes	Yes	Yes	$10,000-$45,000
Software Products & Services, Inc. **(212) 686-3790**	Engineering and Project management-oriented Support System	VAX, Microvax; IBM 370, 4381, PC AT or compatibles; HP Vectra; Intel 8086, 80286; DGMV series; Apollo workstation; Sun workstation; Perkin Elmer 3200	Ada, Pascal, Fortran, C,	Tool kit	Yourdan-DeMarco, Jackson, Parnas, Petri nets	Graphics-textual input, comprehensive analysis	Hierarchy, hierarchy control flow, data structure, data flow control flow, flow charts, Nassi-Shneiderman, Petri nets, hardware block circuit, module connection, data relation matrix	Report	No	Both	Scheduling, cost control, responsibility, progress analysis	Yes	Yes	Yes	Yes	$8,500-$42,000
Software Research, Inc. **(216) 871-8130**	Micro-Cape	Unisys running BTOS, Convergent running CTOS	ISAM, Cobol	Tool kit	Cobol code generator	NA	NA	Report	No	Both	NP	No	Yes	Yes	Yes	$1,800
	Pinpoint-DBM	Unisys running BTOS, Convergent running CTOS	ISAM	Tool kit	NP	NP	NP	Both	No	Both	NP	No	Yes	Yes	Yes	$1,200-$2,400
Sun Microsystems, Inc. **(800) 821-4643 or** **(800) 821-4642**	Network Software Environment	Sun hardware	C, Fortran, Pascal, Ada, C++	Workbench	Any	Any	Any	Screen	Yes	Both	None	Yes	No	No	Yes	$2,500
Synaptic Consulting, Inc. **(312) 779-1566**	Rapid Automatic Programmer	IBM PC or compatibles	Cobol, CICS, DS/1, VSAM, SQL/DS2	Workbench	Generated structured programming	NA	NA	Screen	No	On-line	None	No	Yes	Yes	No	$3,995
Syscorp International, Inc. **(512) 338-0501**	Microstep	IBM PCs or compatibles	C, Dbase III	Workbench	Specification to executable program	Data flow diagrams, prototyping	Icon base data flow	Both	Yes	Both	None	Yes	Yes	No	No	$5,000
Systeq, Inc. **(314) 349-9333**	ZAM II	IBM PC XT, AT or compatibles	Dbase II Plus, C	Workbench	Strategy-oriented	Top-down, bottom-up approach; modularization; decision tables with automatic verification	Decision tables	Report	Yes	Both	System tree (hierarchy of procedures) with statistics on development status	No	Yes	Yes	Yes	$7,000
Technology Information Products Corp. **(617) 246-7730**	TIP Plan	IBM 4300 and up	Cobol	Workbench	Proprietary	Proprietary	Structured charts	No	No	Batch	None	No	No	Yes	Yes	$40,000
	TIP Define	IBM 4300 and up	TSO, CMS, GDDM	Workbench	Proprietary	Proprietary	Structured charts	No	No	Batch	None	No	No	Yes	Yes	$40,000
	TIP Create	IBM 4300 and up	TSO, CMS, GDDM	Workbench	Proprietary	Proprietary	Structured charts	No	No	Batch	None	No	No	Yes	Yes	$40,000
	TIP Relate	Unisys (Sperry), Honeywell Bull mainframes	TSO, CMS, GDDM	Workbench	Proprietary	Proprietary	Structured charts	No	No	Batch	None	No	No	Yes	Yes	$40,000
	TIP Repository	Unisys (Sperry), Honeywell Bull mainframes	Cobol	Workbench	Proprietary	Proprietary	Structured charts	No	No	Batch	None	No	No	Yes	Yes	$40,000
	TIP/PC	IBM PC XT, AT	NA	Workbench	Proprietary	Proprietary	Structured charts	No	No	Batch	None	No	No	Yes	Yes	$40,000
Teledyne Brown Engineering **(800) 673-4675**	Technology for the Automated Generation of Systems	Apollo, Sun 3 series, DEC Workstations, Microvax	NA	Tool kit	Top-down system design	Discrete time event simulation from a compiled design	I/O requirements language	Both	Yes	Both	None	Yes	Yes	No	Yes	$7,000

How Would You Deal With These Problems?


① The CEO wants a completely overhauled customer information system in 9 months.
② marketing needs external research information in their database to keep ahead of the competition.
③ Accounting needs changes to the old system by the next close.

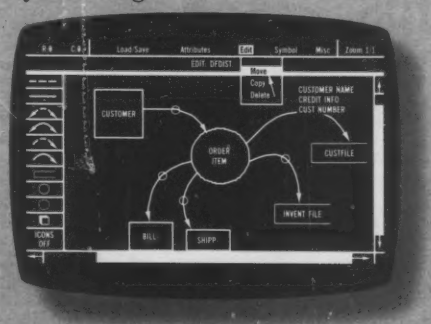
Start with a strong FOUNDATION™. Introducing the Integrated Software Solution for System Development Problems.

FOUNDATION is a full life cycle CASE environment for planning, designing, installing and maintaining systems faster than you've ever anticipated.

FOUNDATION provides the integrated components to tackle large and small system development projects more quickly, more efficiently and with better quality results than you thought possible. Integration virtually eliminates the standard snafus of single function tools. Redundancies. Incompatible functions. Multiple languages.

METHOD/1™ for planning.
METHOD/1 provides an *automated* system for project estimating, work planning, project control and management change control. This established life cycle methodology has been used to deliver thousands of successful applications.

DESIGN/1™ for system design.
DESIGN/1 is a dictionary-based system for analysts and designers to develop data flow diagrams, paint screens and reports, plus facilitate data design and maintenance. To facilitate better system design, the prototyping facility encourages user participation.



INSTALL/1™ for code generation and maintenance.
INSTALL/1 uses the design specifications from DESIGN/1 and generates a production COBOL program. It promotes standardization during the development process by generating everything necessary for an on-line application: records, screens, SQL, logic and copybooks. Configuration management and testing aids complete the system. When maintenance is required, changes are resolved throughout the system automatically.

At the heart of FOUNDATION is a central repository containing an *active data dictionary* that ties the components together. The dictionary is built on DB2™ to exploit its powerful relational capabilities along with the advantages of MVS/XA, CICS, and COBOL II.

FOUNDATION comes with something no other CASE tool or environment can offer. The experience of Arthur Andersen & Co. Experience that comes from more than 35 years of developing systems solutions for our clients. Plus, FOUNDATION is supported by an experienced technical team that can be made available to service your special needs.

To learn how FOUNDATION can help solve your systems development problems call:

1-800-458-8851

FOUNDATION™

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COMPANY	PRODUCT	HARDWARE PLATFORMS	SOFTWARE PLATFORMS	TOOL KIT/WORKBENCH	METHODOLOGIES SUPPORTED	ANALYSIS AND DESIGN TECHNIQUES SUPPORTED	DIAGRAMS CREATED	SCREEN/REPORT PAINTING	PERMITS SIMULATION OF EXECUTION	AUTOMATIC ON-LINE OR BATCH CODE GENERATION	BUILT-IN PROJECT MANAGEMENT FUNCTIONS	WINDOWING CAPABILITY	SPECIFICATION PROMPTS	INCLUDES MAINFRAME PROJECT DICTIONARY/ DOWNLOAD CAPABILITY	MULTIUSER SUPPORT/METHOD	PRICE
Texas Instruments, Inc. (214) 575-4404	Information Engineering Facility	TI Business-Pro; IBM PS/2 Models 50, 60, 80, PC AT or compatibles	DB2, ISPF/TSO, Cobol II, PL/1, MVG/XA	Tool kit	Information engineering	Information strategy planning, entity, data modeling	Matrix; indented list; entity relationship; entity, function, process hierarchy; function, process dependency; process action, dialog flow, screen designer, procedure action, data structure	No	No	On-line	None	No	No	No	Yes	$250,000
Transform Logic Corp. (602) 948-2600	Transform/ Developer, Transform/ Specialist, Transform/ Expert, Transform/ DB2, Transform/ Batch	IBM PC, mainframes	Cobol, IMS/DB, DB2, VSAM	Workbench	Holo (proprietary), any standard structured methodology	Structured modeling techniques, Yourdon, Orr, Chen, Martin, Sarson	Excelerator	Screen	Yes	Both	None	No	Yes	Yes	Yes	$95,000-285,000
Unisys Corp. (313) 972-7000	Ally, Mapper, Linc	Unix-based	Oracle, Unisys DBMS	Workbench	Methodology independent	Methodology independent	Methodology dependent	Both	Yes	Both	No	Yes	Yes	Yes	Yes	$40,000-100,000, Mapper; $30,000-$280,000, Linc; $5,000-$30,000, Ally
Viasoft, Inc. (602) 952-0050	Via/ Insight	IBM mainframes running MVS, ISPF, IMS, IBMS, CICS	Cobol	Tool kit	IBM proprietary	NA	NA	NA	Yes	Both	None	No	Yes	Yes	Yes	$69,000
Visible Systems Corp. (617) 969-4100	Visible Analyst Workbench	IBM PC XT, AT, PS/2 or compatibles	Language independent	Workbench	Yourdon, DeMarco, Gane-Sarson	Any system diagrams	Any system	No	No	No	None	No	Yes	Yes	No	$1,795
Visual Software, Inc. (408) 988-7575	VS Designer	IBM PC AT, PS/2 or compatibles	Language independent	Tool kit	Yourdon, Dickinson	Structured analysis, design; entity relationship, Warnier-Orr diagrams; Ward-Mellor, Boeing-Hatley, Visual-RT	Structure charts, entity relationship, action, Booch	Both	Only with third-party products	Yes	Yes	Yes	Yes	Yes	Yes	$8,500
Xanalog Corp. (617) 938-8722	Graphics-to-Fortran Generator	PC 286, PC 386	Fortran 77	Tool kit	Proprietary	Block diagram modeling	Data flow	Both	Yes	Both	None	Yes	No	No	No	$8,000-$15,000
Yourdon, Inc. (212) 391-2828	Analyst/Designer Tool kit	IBM PCs or compatibles	MS-DOS	Tool kit	Yourdon	Diagraming with data dictionary	Data flow, context, entity relationship, state transition; structure charts	Both	No	No	No	No	Yes	No	No	$1,999

Counting the ways CASE helps

BY JAN SNYDER

Users in many types of business are starting to provide quantifiable figures on the positive results achieved since installing computer-aided software engineering (CASE) products.

For instance, Mark Filteau, vice-president of information systems at The BDM Corp. in McLean, Va., reports that user complaints have declined 75% since his organization started to use Index Technology Corp.'s Excelerator analysis and design tool two years ago. "You can play around with a lot of concepts, but what really matters is the number of complaints about the software," he says.

In addition, Filteau says the number of errors in documentation and the number of errors in code at acceptance have been reduced 50%. That's an important reduction, he says, because "if you can avoid errors up front, it's a whole lot better than if you try to fix them at the back end."

According to Filteau, the principal mechanism for avoiding an error is keeping a good consistent design data base and having the ability to feed information from that data base electronically to a desktop publishing system to avoid errors in documentation as well as in code.

Insurance companies have a reputation of being at the forefront of new technologies, such as CASE, and Royal Insurance in Charlotte, N.C., is no exception. According to Karl Kerschner, a research assistant, an opportunity to introduce CASE into Royal arose when the company decided to set up an information management group as a separate organization within the data processing area.

Royal's Kerschner

"The challenge that we faced was a need for an extensive amount of analysis in order to see what we currently had, how we should organize our approach and how we could align ourselves to business goals and objectives," Kerschner says. The Information Engineering Workbench from Knowledgeware, Inc. was installed to facilitate analysis, design and information architecture coordination.

As a result of using the system, Kerschner says, the information management group has been able to standardize corporate reports and unify them in a relational data base. Using the CASE tools saves 30% to 50% in iterative drawings alone.

Another insurance company, First Capitol Life Insurance Co. in La Jolla, Calif., used testing tools to quantify the benefits derived from providing systems analysts and applications programmers with Netron/CAP from Netron of Canada.

According to James Kennedy, vice-president of systems development services, "When we looked at the programming and testing elements in our pilot projects, we were able to complete those parts of the projects four to five times faster, or with one-fourth or one-fifth of the manpower we had traditionally needed." There are also other, less quantifiable but equally convincing benefits for a company with a significant amount of development work to be accomplished and a heavy maintenance load, Kennedy says.

First Capitol's Kennedy

One is that the program both prototypes and generates usable Cobol code. When sitting down in requirements definitions sessions, clients are able to see if the system is what they want in a matter of minutes.

Although Wilmington, Del.-based Hercules Computer Technology, Inc. did not have an actual estimating tool, it was able to document significant benefits from using CGI Systems, Inc.'s Pacbase.

Pat Guidash, director of systems development, was looking for help in the development of systems, with data management his primary interest. He was using IBM's data dictionary, but it did not enforce standard naming conventions he considered important in systems development. Once Pacbase was installed and the standards and procedures on how the company would operate it were in place, Guidash decided all new development would be done with that system. The result, he says, was a productivity increase of about 10% in new development and 25% in maintenance.

Mary Ann Dixon, a systems development manager at Memorial Medical Center in Springfield, Ill., says she can tell how well the CASE tools used there — the Data Structured Systems Development methodology (DSSD) and Design Machine, Brackets and Structures from Optima, Inc. — are working by counting the number of user-requested changes to systems. "Since we've implemented DSSD, we ask the users a lot more questions to get a better understanding of their business and working environment, so that when we modify reports for them, we know that we've covered all of their needs," she says.

CASE benefits can be quantified. What it takes, says Fred Forman, executive vice-president at American Management Systems, Inc., is just deciding what you mean by productivity, establishing a baseline and then setting up a standard and a system for measurement. ●

Snyder is a free-lance writer based in Lockport, Ill.

Users start cozying up to systems development

BY PETER SCISCO

When the Constitution Health Network (CHN), a health maintenance organization in North Haven, Conn., began to investigate automating its referral authorization process, it knew it was looking at a minimum development time of one year. But that changed in October 1987, when the company took on a pilot development project using computer-aided software engineering (CASE) technology supplied by American Management Systems, Inc.

The claims authorization process was fully automated in six months, and, as a result, both users and developers of the system are now working more closely together. "We had client intervention from the very beginning," says Albert Mignone, vice-president of planning and development at CHN. At the start of the pilot, Mignone had a supervisor devote about one-third of his time to working directly with systems personnel as the system was developed.

CHN's Mignone

Mignone says the supervisor learned a little about the system's technology, while the systems developers learned about claims processing. Increased exchange between the user community and the software development staff has also been observed at CHN's parent company, Blue Cross & Blue Shield of Connecticut, Inc. in North Haven.

CASE "has been successful in fostering an environment where the walls came down, and people are working in the development area quite well now," says Martin Huysman, vice-president of information systems.

Meeting development deadlines is one of the benefits departmental end users frequently cite when they talk of their experience with CASE tools. "The CASE technology allows you to get very rapid turnaround," says Margaret Pearce, senior accountant at the East Bay Municipal Utility District (EBMUD) in Oakland. "It seems astounding to me."

EBMUD's materials management information system, created by an independent systems consultant using Corvision from Cortex Corp. came together in 15 months. Before consultant Ross Mitchell brought CASE technology into the picture, it was estimated that the system would take about seven man-years to develop. And that was for a batch system, Mitchell says, not for the on-line system that the utility has now.

Users and developers trace the time-savings generated by CASE to the start of the development process. "It shortens the process and provides a standardization of logic," says Ned Haskins, vice-president of trading systems development at The Chicago Board Options Exchange in Chicago.

User input at the front end saves time by producing a system closer to what the user had in mind at the time of request.

William Johnson, assistant vice-president of systems administration at the exchange, used Design Machine and Brackets from Optima, Inc. to enhance and upgrade the order-routing process that is the trading floor's central nervous system. He says developers must spend a lot of time with users to determine exactly what their business needs are before working toward an automated solution. The key to CASE, he says, is that it can provide a standard language for both parties.

EBMUD's Pearce agrees, explaining that CASE allows a natural interaction between the user and developer. Ideas, questions, problems and observations eventually evolve into a solution — one usually better than that achieved by traditional development methods.

"I have been in the position of explaining in great detail exactly what I wanted to a programmer, who then developed something that was exactly what I said I wanted and, of course, not exactly what I needed," she says.

"[CASE] allows a lot of evolution as you go through the process," the exchange's Haskins says. "You see better ways that things can be done. And you have the ability, up to a certain level, not to cut off that process."

The exchange's Haskins

Pearce says communication between users and developers does increase information access. "We had so much more involvement with all of the people using the system [that] it expanded what we needed to do by quite a lot, because we realized it would be easy to meet a lot of people's needs."

The interaction that CASE fosters increases the scope of systems under development and gives users a sense of ownership by increasing their understanding of the system. "With many of the other systems that I've used, you send a card in and get a report back, with no sense of what goes on in between. Or you try to figure it out, which is sometimes accurate, sometimes not," Pearce adds.

Of course CASE can't make happy collaborators out of all users and all systems developers. Some users are just too removed from the development process to care how systems are built.

"It would be a strange subject to our physicists and other users," says Paul F. Dubois, a computer science team leader at the University of California's Lawrence Livermore National Laboratory in Livermore, Calif. "They know it is physically laborious to make changes," he says, but they are more concerned with their own work than with systems development. •

Scisco is a free-lance writer based in Charlotte, N.C.

ASK THE VENDOR

The following questions were solicited from users and conveyed to the vendors for responses.

In using Chen & Associates' ER-Designer, Normalizer and DDS-Link, we've found that the data model, once completed, is never updated as the physical data bases are modified and, therefore, becomes obsolete. When will Chen & Associates be providing an automated means to update the data models?

Naomi Griffith
The Coca-Cola Co.
Atlanta

CHEN & ASSOCIATES, INC.: We offer a partial solution now with our Autodraw product, which automatically draws entity-relationship diagrams from English keyword statements. What the user needs to do is reflect the changes in physical data base designs in the textual descriptions of entities and relationships and use Autodraw to redraw the diagram. We are currently beta-testing a reverse-engineering product that converts data base schemas into conceptual data models automatically.

When using Cadre Technologies' Teamwork, I noticed that the editor is not consistent from one module to the next, specifically in the use of the Copy and Paste functions. Are there any plans to make it consistent?

Phil Erb
General Electric Co.
Burlington, Vt.

CADRE TECHNOLOGIES, INC.: Cadre is redeveloping its entire Teamwork product line in object-oriented C++. All Teamwork editors have been rewritten in C++, thereby eliminating any inconsistencies. Product shipments will begin later this year or early 1989.

Does Dest plan on providing a proprietary real-time systems methodology?

Bill Hullsiek
3M Co.
St. Paul, Minn.

DEST, INC.: Currently, the only support in Deft for real-time systems methodology is the ability to draw AST's asynchronous system traps in the program structure diagram editor module. In terms of developing a proprietary real-time systems methodology, our strategy has always been to base our product on existing industry standards and then add extensions that address real world problems. •

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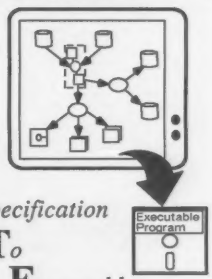

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Time to buy

FROM PAGE S2

old ones. "The sooner you start building up this repository, the sooner you'll benefit from it," she says.

Fast action is a good idea, says Richard Carpenter, president of Index Technology, one of the first CASE vendors. But which action to take depends on your history. "If you haven't used a standard methodology before," he says, "it's best to experiment with CASE in the context of structured analysis."

If you have not previously used structured techniques, plan on six to eight months of piloting before informal dissemination and institutionalization, Carpenter says. "Only a handful of companies are in the institutional stage. Thirty percent to 40% of companies are still just thinking about CASE," he says.

A company should move only when it is fully committed to change, advises Clark Keller, director of industry marketing at Nastec Corp. Becoming shelfware is a particular problem for CASE tools, he notes. "People are buying the promise of a better way. But the transition is often more than they bargained for."

Is it time?

How do you know when you need CASE? "It's a management realization," says Shirley Ann Stern, information systems product marketing specialist at Digital Equipment Corp. "The realization is that application development takes too long and costs too much. You get to the point where you've got to figure out other ways to use people."

According to Stern, "some tools create problems in the work group because the group may have to change, and there's some loss of control. People naturally shy away from less control." She recommends that a company get into CASE "when the highest manager can say, 'I support this' — with money and time to implement the products."

Getting approval does not have to be hard, adds Mike Watters, manager of advanced information management at TI. "You can easily put together a return on investment [for these tools]," he says, "so it becomes just a business decision." •

Prepping

FROM PAGE S5

recognize and adapt to the level of expertise exhibited by the human subject and to collaborate on a level that is pleasing.

• **More flexibility.** There are three fundamentally different philosophies in the architectures of contemporary CASE tools. At one extreme are believers in the pure tool kit approach. Their tools are collections of individually automated methods — expert systems — and they leave it to the CASE consumer to determine the conditions under which any of the capability is to be used and how to integrate the artifacts produced.

At the other extreme are those who think there is only one way to do things. Each tool adheres to a single methodology and rigidly directs the CASE user from one step to the next. The tool is expected to be used in the same manner to address all problems, and artifact integration and consistency is "guaranteed."

The third group is composed of those who believe in tailoring the solution to fit the problem. These tools allow the CASE user to determine which of the tool's capabilities to use and under what conditions. This category will dominate the market within the next three to five years, and AI will be used extensively to tailor the tool's capability without diminishing its rigor, consistency and integrity of results.

• **More creativity.** Two components of CASE suffer from serious gaps in collaborative capability: project planning and system design. Many of the thought processes in both areas appear to be quite similar. In both cases, a high degree of creativity is required to transform ambiguity into specifics. Creativity is one of the more difficult areas being addressed by AI researchers. Today's CASE tools assist in the capture of plans and designs but do little to help conceive them.

It is probable that within the next five to seven years, AI research will make it practical to assimilate extensive creative processing in CASE tools and that a great deal of capability will be aimed at addressing the design gap.

As powerful as today's CASE tools are, there is room for substantial improvement. The era of the fully collaborative CASE machine is probably outside the reach of the next decade.

But many of the prototypes in today's laboratories that mature into commercially viable tools in the next two to three years will bear witness to progress in that direction. •

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— Mark Potenzone
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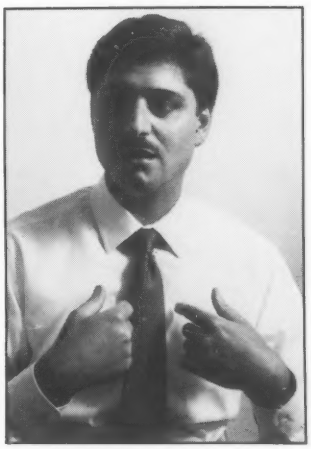

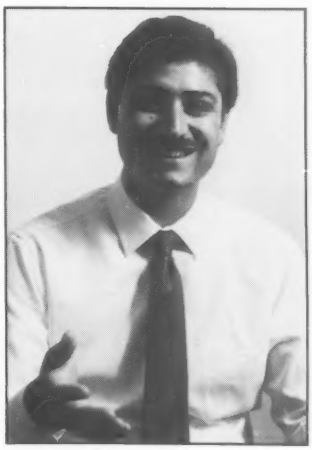

Mark Potenzone is National Sales Manager for Westinghouse Management Systems Software. This group within Westinghouse markets IBM mainframe productivity enhancement software and operating systems software.

Westinghouse has taken advantage of three advertising opportunities that *Computerworld* offers, much to Mark's — and the company's — satisfaction.

"We've done mostly image advertising in order to create awareness of this group. The name 'Westinghouse' is certainly recognizable, but not as a major software supplier, even though we've been in the software business for nearly 20 years.

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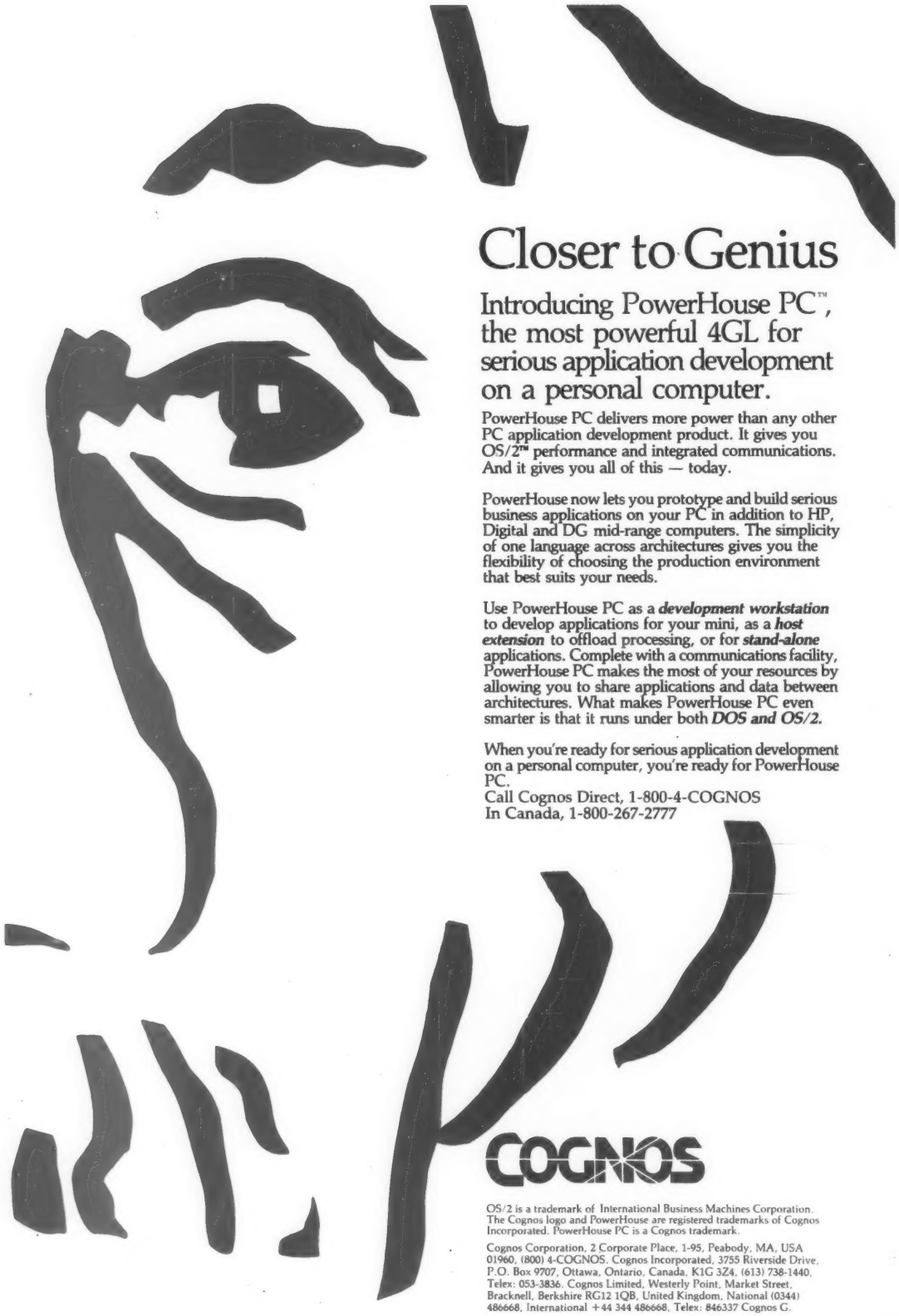
BY STANLEY GIBSON



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HARD TALK

Nell Margolis

New wrinkle for blue suits

If you assimilate change quickly enough that the image of Reagan in Red Square no longer brings out the old "Say *what*?" try this one: Suits at the DECUS symposium. With pencils in their pockets. Loving every minute of it.

Say *what*?

Whatever it said on your desk calendar or astrological chart, the message for May seemed to be "Detente is a two-way street." And while the president's version might have been the more newsworthy, the first occurred mid-month in Cincinnati, where reporters were invited for the first time ever to attend a day's worth of the week-long semiannual Digital Equipment Computer Users Society (DECUS) symposium — no mean example of techno-*glasnost*, considering that DEC's love for the press has tended to rival Richard Nixon's.

There the reporters saw DEC users mingling with the old and the die-hard techies side-by-side with the new-wave techno-marketeers — and couldn't tell the difference.

The blurring of the lines be-

Continued on page 55

Buyers eager for Microvax 3000

Users report that the DEC series fills an array of company requirements

BY STANLEY GIBSON
CW STAFF

Early users of Digital Equipment Corp.'s Microvax 3000 series of processors, which began shipping in January, report that thus far, the series is meeting their expectations for a powerful office environment system.

William Marshall, vice-president and director of information systems at Baring America Asset Management Co. in Boston, took delivery of a Microvax 3600 in February and is in the process of installing a company-wide data base on the system.

Baring America is a financial services firm with $1.5 billion in assets that specializes in endowment and pension management. The firm also runs a Hewlett-Packard Co. 9000 system.

Marshall said he was looking to add a system last fall, when he saw the Microvax 3000 series debut at Decworld in Boston. He said he was interested in hardware that would run Sybase, Inc.'s Sybase data base package. However, there was no version that ran on HP systems, and although the Microvax II could run Sybase, it was not powerful enough to handle the demands Marshall envisioned.

Marshall also required an office environment system that would not require a computer room.

All in all, the Microvax 3000 series filled a number of Baring America's requirements. The company's goal is to connect 30 Microsoft Corp. MS-DOS-based personal computers to the Microvax 3600 using DEC's VAX/VMS Services for MS-DOS to tie the microcomputers to the host.

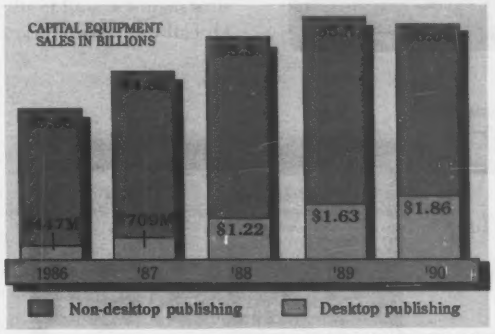
Most users will run Lotus Development Corp.'s 1-2-3 package, which will be stored on the host. In addition to Sybase, Marshall said he will use a package

Continued on page 54

Data View

Pressing on

Sales of non-desktop electronic publishing equipment expected to peak by 1990, while desktop systems will continue steady increase



INFORMATION PROVIDED BY INTERCONSULT, INC.
CW CHART

EMC propels Falcon XP

BY STANLEY GIBSON
CW STAFF

HOPKINTON, Mass. — In an effort to boost performance of its Hewlett-Packard Co. 3000-compatible disk drives, EMC Corp. recently announced an addition to its Falcon series of disk subsystems that includes write-once cache.

The 625M-byte Falcon XP has 64K bytes of write-once cache memory in addition to the 4M bytes of read cache available on previous Falcon models.

The write-once cache allows the Falcon to store any size read

Continued on page 55

U.S. grants spur gains in imaging

BY J. A. SAVAGE
CW STAFF

The old professorial adage "publish or perish" may become "visualize or perish" if government funding sustains the current growth of visualization in scientific computing.

And though imaging began in the academic arena in the early 1960s, long before industry adopted it, its largest market lies in industrial and pharmaceutical research and design.

In the last few years, however, ivory-tower scientists have been commanding a growing share of the market because funding for imaging hardware has become increasingly available through the National Institutes of Health (NIH).

Funding increase definite

No hard figures are available that break out the increase in computer funding from NIH's total of $4.4 billion in academic

Continued on page 55

Inside

- Exide wins $621.8 million Air Force contract. Page 53.
- Aydin adds VGA-compatible monitor to Patriot line. Page 56.
- Clary rolls out RS-232 signal-level interface for micros, LANs. Page 56.

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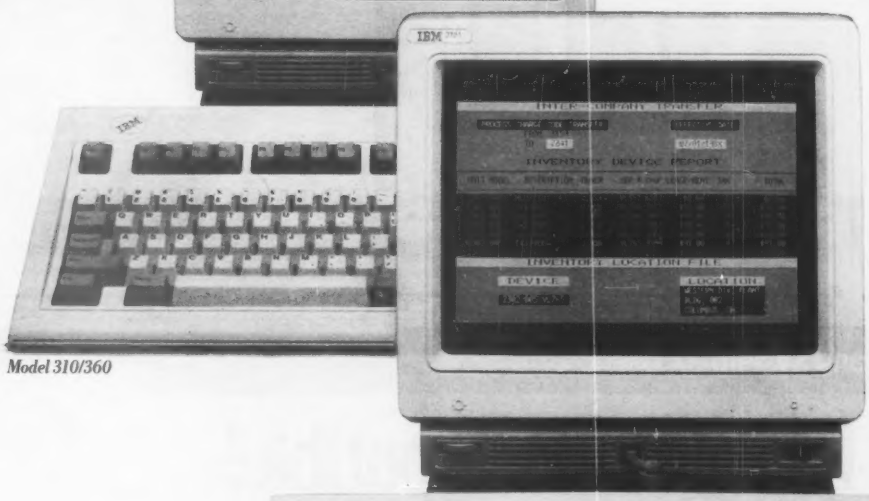

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HARDWARE NOTES

Exide wins Air Force bid

Exide Electronics Corp. in Raleigh, N.C., recently won what it claimed is the largest contract ever awarded for computer power protection and support, worth $621.8 million. The company said the deal calls for Exide to supply its uninterruptible power supply (UPS) systems to the U.S. Air Force Logistics Center.

The UPS systems will be used with computers in command, control, communications and intelligence, air traffic control and satellite and long-haul communications networks. Most of the systems will be installed in the U.S., with some being deployed overseas, according to Exide.

The UPS systems will cover a wide range of capacity. Included in the contract are installation, spare parts and service, the vendor said.

Arix Corp. in San Jose, Calif., recently reached an OEM agreement with **Orion Associates Ltd.** in Monte Carlo, Monaco.

Under the terms of the deal, which is valued at $30 million during the next three years, the Arix 800 line of multiprocessor, Unix-based systems will be remarketed under the Orion Formula label.

Orion has a network of 22 distributors in 25 countries and an installed base of more than 11,000 Unix systems in Europe and Southeast Asia, according to Arix.

Mike Lambert, Arix's vice-president of marketing and sales, said Orion's library of software applications is being ported to Arix hardware.

Also on the OEM front, **Sun Microsystems, Inc.** and **Digital Matrix Services, Inc.** recently announced an agreement said to be worth approximately $3 million.

Under terms of the agreement, Digital Matrix Services will sell Infocad, a civil engineering computer-aided design package for use on the Sun 386I, Sun-3 and Sun-4 workstations.

Sun has also signed an OEM agreement with **Integrated Computer Graphics, Inc.**, which is said to be worth more than $10 million during the next 18 months.

Integrated Computer Graphics, which supplies technology and services for the home building industry, said it will use the Sun workstations as servers for its Computer Integrated Building solutions.

Charles River Data Systems, Inc. in Framingham, Mass., recently announced it has reached a distribution and investment agreement with **Kawasaki Steel Corp.** in Japan.

Charles River Data Systems will supply Kawasaki Steel with its Universe family of Motorola, Inc. VMEbus-based 32-bit super microcomputers and UNOS, the company's real-time operating system based on AT&T's Unix.

Kawasaki Steel will sell Charles River's systems exclusively in Japan. Shipments to Kawasaki were slated to begin last month. Charles River Data Systems' Universe family of systems was designed for laboratory and industrial control applications.

Kawasaki Steel, with annual revenue of more than $6 billion, has been diversifying in the computer industry since 1983.

Alpharel, Inc. in Camarillo, Calif., has agreed to buy $10 million in optical disk products during the next two years from **Eastman Kodak Co.'s Mass Memory Division.**

The agreement covers Kodak Optical Disk System 6800 products, including disk drives, media, controllers and automated disk libraries.

Alpharel plans to integrate Kodak's write-once read-many drives into its Digital Documentation, Transmission and Management System, an optical imaging system that Alpharel tailors to each customer.

Each Kodak 14-in. optical disk stores 6.8G bytes of data. Kodak also offers an automated disk jukebox containing 150 disks, which can be retrieved in 4.5 sec., Kodak said.

Digital Programming Services, Inc. (DPS) in Waltham, Mass., recently announced it will resell Honeywell Bull, Inc.'s XPS-100, DPS 6 Plus and personal computer product lines, porting its applications from Wang Laboratories, Inc. systems.

DPS sells point-of-sale, order entry, inventory control, accounting and sales analysis applications. DPS applications originally written for the Wang 2200 system will be migrated to the Honeywell Bull XPS-100.

DPS's other applications, which run on the Wang VS product line, will be ported to the DPS 6 Plus.

Digital Equipment Corp., Fisher Controls International, Inc. and Monsanto Chemical Co. will join forces in a computer-integrated manufacturing project at Monsanto's Pensacola, Fla., plant.

The firms will identify and evaluate how energy is generated and used in the manufacturing process. The ultimate goal is to integrate energy generation and manufacturing, DEC said.

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East Coast start-up touts low-cost parallel system

NEW BEDFORD, Mass. — International Parallel Machines, Inc. recently unveiled a low-cost parallel processing system that is priced at $1,500 per million floating-point operations per second (MFLOPS).

The start-up company based here introduced the IP-1 computer at the Second World Supercomputer Exhibition in Boston.

Running the AT&T Unix System V operating system, the parallel machine is sold with Fortran and C compilers to optimize existing programs to run in parallel. Each processor in the system performs vectorization as well, the vendor claimed.

Running the 64-bit Linpack benchmark, a single-processor system can perform 8 MFLOPS and a nine-processor version can perform 55 MFLOPS, according to the vendor, with a price per MFLOPS of $4,000.

The system was designed for seismic analysis, aerospace simulation, computational fluid dynamics, chemical modeling, structural analysis and data bases too large to be handled by mainframes.

"All processors can access a shared memory simultaneously without arbitration," said International Parallel President Robin Chang, claiming the company's parallel system is the first with such a capability.

A single-processor IP-1 with 8M bytes of memory, a 170M-byte disk drive, an operating system and a C compiler is priced at $49,000.

A nine-processor system with 72M bytes of memory, a 170M-byte disk drive, an operating system and a C compiler is priced at $220,000.

The processor is currently being run at beta-test sites and is available for customer shipments, Chang said.

Microvax

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called Multiplex from Cupertino, Calif.-based Network Innovations Corp., a firm acquired by Apple Computer, Inc. in March. Running on the PCs, Multiplex will serve as an interface to Sybase for PC users and offers them access to Sybase data using 1-2-3-type interfaces.

"With Multiplex and Sybase, it was a normal fit for our users," Marshall said. Having seen a similar configuration at another Boston financial services firm, he said he was convinced the system would work.

The Microvax 3600, running VMS Version 4.7, is configured with one RA 81 and one RA 82 disk drive and stores approximately 1G byte of data, according to Marshall.

Marshall said he plans to connect both the HP 9000 and Microvax 3600 on an Ethernet network.

Baring America ordered its 3600 in November and received it in February, a lead time consistent with DEC's current backlog of 60 days on Microvax 3600 systems. Duncan Anderson, DEC's Microvax systems marketing manager, said in addition to the 3600 backlog, his firm has a backlog of 90 to 120 days for the 3500 and 90 days for the 3200.

Lower license fee

Marty Lindner, senior systems programmer at the University of Pittsburgh, is using a Microvax 3600 as a network management server on a very large Ethernet. The processor contains the data base for the university's Decnet and Transmission Control Protocol/Internet Protocol configurations. In that installation, the Microvax 3600 replaced an 8000 series VAX, Lindner said. He noted that one benefit of the more compact processor is a lower license fee for software.

DEC's Anderson reported that a very large order for Microvax 3000 systems was placed recently by a systems integrator for the U.S. Department of Defense. The contract, which will computerize some 750 hospitals, will include approximately 1,000 Microvax 3000 processors, he said.

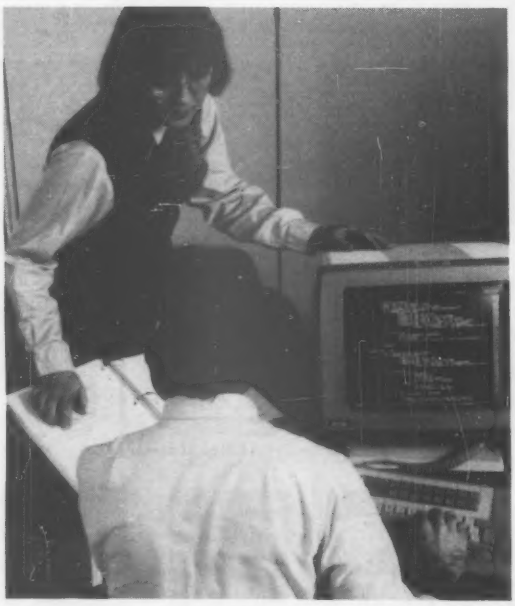
Anderson also said that Chicago Title & Trust Co. is in the process of installing 150 Microvax 3000s.

By the end of June, DEC will have shipped more than 5,000 Microvax IIIs, according to Anderson. He predicted that Microvax 3000 sales will grow faster than sales of Microvax II during the first years of that product's life. He also predicted that by 1990, the total installed base of all Microvaxes, including Vaxstations, will amount to more than 200,000.

At a recent DEC product rollout, DEC President and Chief Executive Officer Ken Olsen said his company is faced with a very stiff demand for systems using the CMOS Microvax III microprocessors — a demand that is straining the vendor's ability to produce the chips in sufficient quantity.

DEC recently announced its 6200 series of symmetrical multiprocessing systems and real-time versions of those systems, all of which use the Microvax III chip.

The Microvax 3000 systems are assembled in DEC's Westfield, Mass., manufacturing plant, and the CMOS microprocessors are made in DEC's Hudson, Mass., semiconductor facility.



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U.S. grants

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grants. "But there's no question that it's increased," said Joe Brackett, chief of NIH's report section.

Brackett estimated that half of the grant money goes to medical research, the largest academic consumer of graphics computers.

NSF support

Support for graphics computing is also coming from the National Science Foundation (NSF), which last year commissioned a joint academic/vendor report on visualization in scientific computing.

The NSF report describes technical and academic barriers blocking greater use of graphics computers and calls for further government funding — 1% of what industry is spending on visualization, or about $2.5 billion in the early 1990s.

"Every scientist and engineer should have a personal workstation, just as people who must drive for a living need access to cars," the report said.

Thus far, the NSF has spent $130 million for five academic supercomputer centers and has budgeted another $108 million for the next two years.

That amount, according to NSF Comptroller Sandra Toye, is matched with state and industry funding, totaling approximately $500 million for supercomputer centers by the end of 1990.

But after the centers were established, they were not given the funding to develop the necessary software, according to Maxine Brown, associate director of electronic visualization at the University of Illinois at Chicago.

The NSF report, which Brown edited, is aimed at increasing the awareness of the role visualization plays in scientific computing and, thus, is expected to step up funding for its development.

"People started asking for funds [for development], and the NSF said, 'We already gave you money,' " said James Clark, chairman of Silicon Graphics, Inc., who was on the NSF panel.

There is no information yet on whether the report, packaged with its own videotape, has loosened government purse strings.

However, graphics computer vendors said they see the academic market getting stronger. Academic computing will double its 12% share of Mountain View, Calif.-based Silicon Graphics' business in the next couple of years, according to Clark.

Driving the academic market will be the decreasing cost of graphics computers.

"It's difficult to justify [to funding agencies] spending $200,000 for a research computer for a couple of grad students vs. setting up a lab with 20 or 30 workstations and software for the same money," Clark said. Silicon Graphics has said it plans to introduce a $15,000 graphics workstation by the end of this year.

> "EVERY scientist and engineer should have a personal workstation, just as people who must drive for a living need access to cars."
>
> NATIONAL SCIENCE FOUNDATION REPORT

Market still there

But that does not necessarily mean that the market for high-end graphics supercomputers is on a downswing.

A spokesman for Sunnyvale, Calif.-based Ardent Computer Corp., whose Titan supercomputer starts at about $100,000, said he expects the academic market to account for approximately one-third of Ardent's sales this year — the first year of its availability.

While more scientists are using supercomputers and graphics workstations, academic traditions have not adapted to the graphics computer age.

"People in academia get rewarded based on the number of papers published in technical journals," Brown said, suggesting that giving professors credit for submitting videotapes of visualization experiments might be justified as well.

Margolis

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tween what used to be two irreconcilable computer industry cultures with bastions based in Armonk, N.Y., and Maynard, Mass., has, of course, been noted. However, the drift has always seemed to be in one direction: DEC goes after the commercial market, VAXs infiltrate Wall Street, VAXs make their mark in banking. It isn't just for techies anymore.

Last month's DECUS event, on the other hand, showcased the two-way nature of the equation behind the new DEC and the evolving technology market. Sure, we've seen DEC guys wearing suits and ties and even spouting a fairly respectable marketing line. But here was the reverse: Users not only from the commercial sector but, in some cases, relatively new to computing — the Suits and the Short Pants — wonking it up at an event that is to nerds what Disneyland is to kids.

And, I repeat, eating it up.

"I need to expand my knowledge, and this is a wonderful opportunity," gushed a young, recently appointed technical support professional. The selection — more than 1,000 hours of seminars and technical sessions crammed into six days — and the very length of the colloquium were enticing to him.

"If I leave my office for one day to go to a technical seminar, I get limited information and I can't always take it in fully because of all the work I have to make up as soon as I get back," he said. "But with DECUS, I get a much broader information exchange. And I'm out of the office for five days, so I get to delegate my work load, which gives me some time to digest it all."

Casing the joint

An IBM employee traveling incognito in shirt-sleeves, complete with pencils in pocket and Styrofoam coffee cup in hand, confessed that his DECUS membership gave him an incomparable opportunity to case DEC directions for his own company. "More and more, our customers expect us to be making a lot of technological progress — and now, not tomorrow. One of the best places to learn how to do that is here," he said.

Statistics, DECUS public relations folks and attendees all tell the same tale: DECUS is evolving with DEC, and what was once a pure technological preserve is taking on a distinctly commercial flavor.

But just as Moscow is now getting a chance to be as charmed by the Reagans as Washington was by the Gorbachevs, the exchange in the technology industry is turning out to be just that — not only the commercialization of DEC but the technification of the commercial.

Whether or not the IBMers and their ilk come to the DECUS symposium to laugh, a goodly number are surely remaining to pray.

Margolis is a *Computerworld* senior writer.

EMC

FROM PAGE 51

or write to the disk drive. The feature can improve performance by 7% to 20% over the previous model, according to the vendor.

Hewlett-Packard's Eagle drives contain 4K bytes of write cache and 2M bytes of read cache, according to an HP spokesman. EMC's other Falcon systems do not contain write cache, an EMC spokesman said.

In addition to this new feature, the Falcon XP contains the same capabilities of the previous model, including EMC's proprietary caching algorithm, which gives users the ability to adjust cache sizes to fit their applications.

The Falcon XP's controller is manufactured by EMC, and the disk itself is made by NEC Corp.

Currently shipping in volume, the Falcon XP is priced at $17,450.

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NEW PRODUCTS

Terminals

Aydin Controls has expanded its line of Patriot monitors with the addition of the **VGA/20**.

The 20-in. monitor is compatible with all modes of the IBM Video Graphics Array (VGA) graphics standard, including the 8514/A, and provides resolution of up to 1,024 by 768 pixels with 256 colors. The product offers automatic picture sizing, which provides full-screen displays in all VGA modes without manual adjustment. The VGA/20 is available in a plastic cabinet for business settings and a metal chassis for the engineering and factory floor environments.

The VGA/20 costs $2,545.

Aydin Controls, 414 Commerce Drive, Fort Washington, Pa. 19034. 800-366-8889.

Power supplies

Clary Corp. has enhanced its personal computer uninterruptible power supply (UPS) series for microcomputers and local-area networks with the addition of an RS-232 signal-level interface for the **Onguard PC-1240 and PC-2400**.

The Onguard PC-1240 supports two IBM Personal Computer ATs or compatibles and reportedly provides 360VA UPS power and 480VA filtered power for peripherals. The unit costs $890.

The Onguard PC-2400 supports two LAN file servers with a reported 12 to 24 minutes of backup power, depending on configuration. The unit delivers 750VA UPS and 480VA power to peripherals and costs $1,490.

Clary, 320 W. Clary Ave., San Gabriel, Calif. 91776. 818-287-6111.

A **surge suppressor** that protects microcomputers, high-fidelity audio systems and other sensitive electronic systems from voltage spikes and surges on an AC power line is available from **Volta Diagnostic Systems, Inc.**

The product features a three-stage suppression circuit that incorporates silicon-transient voltage suppressors, metal-oxide varistors and gas-discharge tubes. All three of those circuits clamp both common- and transverse-mode voltage spikes. A noise filter for the AC power line is also included.

The surge suppressor costs $299.95 and comes with a one-year warranty.

Volta Diagnostic Systems, 421 Woodland Place, Leonia, N.J. 07605. 201-944-3540.

Components

Symbolics, Inc. and **Event Technologies, Inc.** have jointly announced a high-speed interconnect between the Symbolics 3600 series and the industry-standard VMEbus.

Called **LVI**, the connection product reportedly transfers data between a Symbolics system and VMEbus-based hardware at burst rates approaching 40M byte/sec.

In addition, 128K bytes of dual-ported memory for sharing control and status information between the Symbolics system and VMEbus-based computers are included.

The product consists of a module that plugs in to the Symbolics backplane and a double-height VMEbus board, both of which are connected by way of shielded cable.

LVI costs $9,995.

Event Technologies, 200 5th Ave., Waltham, Mass. 02154. 617-890-2440.

Robotics

Hudson Robotics, Inc. recently announced an adhesive dispensing robot system that was manufactured by CRS Plus in Canada.

The core of the system is the **Model SRS-M1A** robot, which can be combined with one of three different kits to dispense low-viscosity, high-viscosity or two-part adhesives.

The Model SRS-M1A robot was also designed for conformal coating, solder masking and a variety of sealant applications.

The product can be programmed using RAPL operating software.

The SRS-M1A is priced at less than $24,000.

Hudson Robotics, 120 Morris Ave., Springfield, N.J. 07081. 201-376-7400.

Maintenance equipment

The **Data Precision Division** of **Analogic Corp.** has announced its **Model 660-1 Plug-In**, a testing device for use with the vendor's Data 6100 mainframe computer.

The unit was designed for a variety of applications, including transient capture, nuclear magnetic resonance and ultrasonic testing.

In a one-channel ping-pong configuration, the product reportedly samples rates up to 250 megasamples per second at a bandwidth of 125 MHz and an acquisition length of 128K data points.

Inputs to the unit can be handled as two single-ended inputs or as a true differential pair.

The Model 660-1 Plug-In costs $7,995.

Analogic, 8 Centennial Drive, Peabody, Mass. 01961. 617-246-0300.

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ISDN: What's here now

Action you can take — today — toward integrated network services

BY MICHAEL FINNERAN

Integrated Services Digital Network (ISDN) is the biggest idea the telephone business has hatched for the last 100 years. But with ISDN industry standards still not set and customer skepticism running high, the major ISDN carriers hesitate to throw their full weight behind ISDN.

The one point on which there seems to be no balking is that the development of ISDN will be a participative effort. There are five major groups that will have a hand in the development of ISDN — equipment suppliers, common carriers, end users, computer systems manufacturers and regulators.

None of these parties can make ISDN happen without at least some participation from the others. Instead, what ISDN will mean in the long term will evolve from the interaction of these market players.

Equipment suppliers

The force driving ISDN is the central office equipment suppliers, primarily AT&T Network Systems, Northern Telecom, Inc. and, increasingly, Siemens AG. These suppliers' participation is critical because they make the components carriers will use to build ISDNs. They have invested most heavily in developing ISDN capabilities for their systems, realizing that its acceptance will have a major impact on their future revenue.

To that end, the central office equipment suppliers are underwriting much of the cost of the ISDN trials. While the results of current trials have been encouraging thus far, only the ISDN subscriber interface is being tried — and it is not being tested with the American National Standards Institute (ANSI) specification that will eventually be used with the real ISDN.

Furthermore, products such as Datapath from Northern Telecom already provide data terminal connection through a digital switching matrix without using ISDN. This capability has existed in the private branch exchange (PBX) area for several years.

The more interesting trials are slated to occur this summer, when the network signaling and intervendor tests between AT&T and Northern Telecom are conducted. Also, we hope to know by then whether ISDN services will cost more to provide than the present mix of network services.

The other equipment suppliers, those involved in customer premise equipment (CPE), are also announcing ISDN station equipment or PBX interfaces that implement the ISDN-defined subscriber interfaces. However, the cost of the station equipment remains higher than the price range for mass market penetration.

ISDN station equipment typically costs between $600 to $1,000 per set (that is, the TE 1 and NT 1 hardware components necessary to support a Basic Rate Interface).

For now, that price matches the per-line cost for a PBX system. But the ISDN price is predicted to decline dramatically with competition and volume manufacture. Within two years, a rudimentary ISDN station set will probably cost less than $150 — including the NT 1. This price level already exists in the smaller, noncompetitive market for PBX digital station sets.

A number of vendors have announced intentions to manufacture ISDN subscriber interface components, including AT&T, Northern Telecom, Fujitsu America, Inc., Hayes Microcomputer Products, Inc. and NCR Comten. Once equipment becomes available, the question then becomes one of cost and utility. One factor that does seem to be hindering the market for ISDN CPE is the lack of a universally endorsed standard for the ISDN subscriber interface. ANSI is due to publish the first version of the basic-service features for an ISDN subscriber line this year, after which more vendors may plunge into the market.

Common carriers

The common-carrier community still sends out mixed signals on ISDN. Certainly their advertising indicates a true commitment, but the telephone company personnel, who will be building the ISDN, seem decidedly unconvinced. The trouble is that the telephone companies have

BLAIR THORNLEY

Finneran is president of Dbrn Associates, Inc., a data base consultancy in Woodmere, N.Y.

- **Consumer skepticism runs high**
- **ISDN as a participative effort**
- **How much will it end up costing you?**

become essentially one-product companies: They sell dial tone. ISDN will require new thinking.

Fortunately, ISDN may be a low risk for telephone companies. The major technologies proposed for ISDN — digital transmission, digital switching and common channel signaling — have already proven their value in the public network during the last 25 years (see story page 61).

ISDN essentially defines standards for how these technologies can be implemented and extends their scope from the carriers network down to the subscriber level.

If the technology bet is right, then the investment in ISDN might be justified simply by reducing the cost of providing basic dial tone service. Results from Bell Communications Research Corp.'s research project "ISDN Economic Evaluation" indicate that ISDN development costs in central office equipment might be more than offset by savings in other areas, particularly in loop technology and service provisioning. ("ISDN Strategies" July 1987.)

If the investment is justified simply on operations cost savings in the network, then we are getting all the potential benefits of ISDN for free.

Taking all into account

Unfortunately, the current ISDN trials are unable to substantiate any of these claims. Not being aired are such all-important cost factors as the percentage of existing subscriber loops that will support the transmission interface described for Basic Rate access; the amount of craft time required for provisioning an ISDN line vs. a "plain old telephone service" line; and central office processor capacity requirements for servicing ISDN subscribers.

If some of the information from the current trials makes its way into the public domain, it could go a long way toward silencing the ISDN nay-sayers.

It remains to be seen whether the management of telephone companies will be able to lead that same work force that has been able to provide reliable, affordable dial tone service into an entirely new type of service business and whether we can develop a regulatory structure that will allow it to happen.

Getting carriers committed is key in ISDN development, but the carriers are, in turn, looking for commitments from their large business customers. The first real market for ISDN services appears to be among medium-size to large business Centrex users.

Some of those customers have made commitments to ISDN — 3M Co. and Tenneco, Inc. are among the most recent and most notable — but by and large these firms are already pledged to Centrex service. Their stamp of approval is simply an acknowledgement that ISDN represents a new set of services that will be available on Centrex.

The local telephone companies, which

Continued on page 61

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What is ISDN?

ISDN is an internationally endorsed plan to migrate the public telephone network to the standard use of digital technology. The Consultative Committee on International Telephone and Telegraph, whose job it is to devise standards for its implementation, defines ISDN as:

"... a network in general, evolving from the telephone Integrated Digital Network (IDN) that provides end-to-end digital connectivity to support a wide range of services, including voice and nonvoice services, to which users have access by a limited set of standard multipurpose customer interfaces."

The goal of ISDN is to provide a more functional network to transport all types of digital information, regardless of its source. ISDN incorporates many of the standards and technologies pioneered for IDN, such as pulse code modulation and standard bit rates. This means that with enhancements made possible by the use of computer-controlled switching systems, ISDN can provide the same basic service we have today, such as switched voice and private line.

More important, ISDN allows for other types of service not currently available, such as higher transmission rates and part-time private line service.

The key to ISDN's flexibility lies in its multipurpose subscriber interface. The interfaces will be digital, and each will carry a number of "bearer" or B channels that operate at 64K bit/sec. and carry user traffic as well as a D channel that carries signaling messages.

Currently, two subscriber interfaces have been defined for North American ISDNs. They are Basic Rate Interface (two B channels and one 16K bit/sec. D channel) and Primary Rate Interface (either 23 B channels and one 64K bit/sec. D channel or 24 B channels).

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ISDN: Lore and legend abound

Misconceptions about Integrated Services Digital Network (ISDN) abound, particularly because people try to gauge the potential impact of ISDN based on its individual components or features. Looking at its benefits in a piecemeal fashion belies its overall importance and results in misconceptions about its true capabilities.

Myth 1: "ISDN is a voice technology. It's not going to have any effect on data networks; we use private lines."

The ISDN trials primarily focus on voice, but data services can definitely be provided. ISDN can transmit any type of information, including digitized voice, digital data, facsimile, telemetry or low bit-rate digital video and private line service.

Replacing a private line-based network with cheaper and more flexible ISDN-based switched services could potentially represent a major cost savings. The catch is that the computer systems manufacturer must develop the capabilities to use ISDN as a functional communication alternative.

Myth 2: "The 64K bit/sec. data rate provided on ISDN is too slow; we transmit information on local-area networks at well over 1M bit/sec."

The ISDN standards define rate adaptation algorithms to support data rates from 50 to 64K bit/sec. on a B channel, but the standards also define H0 and H11 rate connections operating at 384K bit/sec., for example, six B channels. The standards also support a 1.536M bit/sec. — for example, 24 B channels — rate for North American ISDNs. Beyond those rates, standards committees are starting work on a broadband ISDN where the basic data rate will be approximately 50M bit/sec.

In addition, ISDN is an interpremise as well as an intrapremise solution. We will typically use a lower speed and a modified protocol when we connect LANs together over external facilities.

ISDN services and LANs will likely coexist, since ISDN can certainly support the same type of connections offered by LANs as well as provide other options for interLAN connectivity.

Myth 3: "If ISDN planners were serious about data communications, they would have built ISDN around packet switching, not circuit switching."

ISDN recommendations provide for both circuit- and packet-switched services. The network provider — not the ISDN planners — decides whether or not to provide packet switching. Also, standards activity seems to indicate that the broadband ISDN might be based primarily on a form of packet technology.

Myth 4: "It's not worth worrying about ISDN now because committees have not even finished the standards."

True, the ISDN standards remain unfinished. But we know the structure and the variety of ways that call-processing tasks can be accomplished using ISDN recommendations. What remains is to define which of those functions will be provided initially and the exact sequence of signaling messages that will be used to access them. The American National Standards Institute's standard for ISDN basic subscriber services is due in the middle of this year, and the standard for supplementary services — such as call waiting and call forwarding — is expected by the end of the year.

Myth 5: "ISDN service will be significantly more expensive than current network service."

In the short term, yes; in the long term, maybe. While prices for an ISDN telephone are currently around $1,000, including the NT 1, the cost should drop to the $100 to $150 range of basic private branch exchange (PBX) digital sets, like IBM/Rolm Corp.'s "Rolmphone 120," within the next two to three years.

At the moment, telephone companies are pricing ISDN Basic Rate subscriber lines at about 1½ to two times the price of a standard analog business line. However, using ISDN digital technology in the network can significantly reduce engineering and operations costs.

Myth 6: "We can already do everything ISDN promises on a digital PBX."

Some ISDN features are "old hat" in the PBX business: digital telephone sets with single-button access to features and out-of-band signaling; simultaneous voice and data service on shared wire pair facilities; and the use of a single switching network for both voice and digital data calls. However, there are some major differences in the implementation of these same capabilities in an ISDN.

First, those PBX functions can only be provided in locations served by a PBX — typically locations with more than 100 telephones to serve. ISDN will be a public network service available to everyone.

Second, the PBX features are provided using a proprietary vendor interface. ISDN interfaces are standardized so the user can buy station devices such as telephone sets, data terminal interfaces and personal computer communication boards from a mix of suppliers.

It remains to be seen how ISDN will be used in conjunction with PBXs, T1 multiplexers, diagnostic systems and other current network devices. What is certain, however, is that the ISDN structure provides a portable manufacturing standard.

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ISDN

CONTINUED FROM PAGE 58

provide the Centrex service, are hoping that an ISDN-Centrex venture will provide additional functionality and reverse the trend toward premise-based PBX systems that has been eroding the Centrex base since the mid-1970s.

According to a survey conducted by The Market Information Center, Inc. in Marlboro, Mass., the percentage of business locations served by Centrex systems, as opposed to PBX, has stayed in the 20% range for the last four years.

The business customer is clearly taking a wait-and-see attitude — weighing ISDN in terms of cost and how its capabilities stack up against those of the competition's.

ISDN's simultaneous voice/data communications can be provided by a digital PBX system, which also offers many of the same loop-efficiency techniques described for ISDN.

Data networking capabilities can be built into existing data processing systems, front-end processors or packet switches.

Large business users are already building integrated voice/data transmission networks using DS-1 and DS-3 rate transmission services provided by a carrier and customer premise-based multiplexing equipment.

To attract customers to ISDN, service providers have two options. They can outdo current offerings by providing higher transmission rates and extending a common channel signaling system to the subscriber over the D channel. Or they can provide PBX capabilities at a lower price.

Theodore Irmer, director general of the Consultative Committee on International Telephone and Telegraph, cautioned carriers not to overprice ISDN services at an IBM forum on ISDN development held in November 1987 in Research Triangle Park, N.C.

Selecting ISDN-based services over other alternatives is essentially a business decision. If business customers do not see a price or function advantage to be gained from ISDN, they will not buy it.

Clouding any potential purchasing decisions is the end-user trade press, which has gone out of its way to raise questions as to whether ISDN is a flawed technology.

The general tactic is to pick out one ISDN feature, such as 64K bit/sec. circuit-switched service, and argue against that alone (see story page 60).

The general effect is that of doubt, and doubt is a reason to defer any real commitment. This is particularly maddening because these petty technical spats miss the point entirely. The important thing about ISDN is that it provides a structure in which to implement new technologies in the network.

Systems manufacturers

Support for ISDN among computer systems manufacturers up to this point can be summarized as lip service. Vendor participation is critical, because the communication software they develop and support will define the communication options available.

The decision to support ISDN, and the functionality that is provided through it by the DECs and IBMs of the world, will determine how useful ISDN will be in serving our data networking requirements.

There are some obvious advantages to ISDN, particularly when compared with current service offerings in the public network. Examples include support for switched connections at higher data rates, better error performance through end-to-end digital service and the provision of new services such as a part-time private line.

All of the announcements from computer vendors say they are "fully committed to the concept of ISDN," which is the same as saying they are fully committed to the concept of gravity.

I'm glad we don't have to worry about their equipment floating away, but I would like some more assurances when it comes to their support of ISDN.

Such endorsements do not appear to be forthcoming. To date, the only DP commitment I'm seeing is to use ISDN as a replacement for modems.

Whether or not we use ISDN to provide cheaper or more flexible data communication services will be determined by the degree to which computer manufacturers internalize the ISDN interfaces into their products and make the network service a part of their basic communication structure.

Based on the Open Systems Interconnect Reference Model, ISDN defines a fairly low level of compatibility. A B channel connection on ISDN is effectively a Layer 1 (physical layer) interface while D channel connections define Layers 1 through 3 (physical, data link and network). Once the physical link is in place, the data terminals must also establish a session and parameters for higher layer protocols.

In current data communication systems, the session establishment procedure occurs over the physical interface once the physical link is in place (the data

Costing you less in three areas

ISDN's initial offerings will likely cost more than their analog equivalents. But ISDN may ultimately result in a cost reduction of basic telephone service on top of providing new services.

ISDN relies on three technological components, each of which was originally proposed to generate cost savings. Customers should notice an impact in three primary areas:

Digital transmission/digital switching. The original idea for bringing digital technology to the network was to provide better quality at a lower cost. The T1 Carrier and digital central office switches went part of the way.

ISDN can go further by attacking engineering and operations costs. Given that digital components are generally more reliable than analog electronics, maintenance costs are reduced. Also, the use of digital transmission systems for voice can greatly simplify the process of transmission engineering.

Common channel signaling. Common channel signaling defines the use of a data network that overlays and controls services on the voice network. The ISDN Signaling System Number 7 standard describes the use of common channel signaling not only in the network — the scope of the original AT&T Common Channel Interoffice Signaling (CCIS) plan — but also in the interface to the subscriber.

The advantage of the network part of the common channel signaling system is the same as for AT&T's CCIS: better trunk utilization by avoiding blind alleys, more flexibility to adapt the network to changing traffic conditions, faster call set-up, less opportunity for toll fraud and the capability to provide different services.

The use of common channel signaling on the subscriber interface, however, is new to the public network with ISDN and is key to the inherent flexibility of an ISDN.

Now, the subscriber can ask for different types of connections for the B channels over the interface simply by sending different signaling messages. In a large telephone system, costs can be reduced by eliminating the requirement to maintain separate trunk groups for each service being used.

Further, a new network service can be made available to an ISDN subscriber by defining the D channel signaling messages that must be sent to access the service. In effect, new network services could be defined by software rather than hardware.

Loop efficiencies. The other obvious area for savings through ISDN is in better utilization of the subscriber plant. The subscriber plant is the telephone company term for those masses of copper wire facilities that connect subscribers to the public network. The subscriber plant represents an expensive and troublesome part of the provision of local service.

Today, a single pair of copper wires is normally used to provide a one-subscriber line connection to the network. When used with an ISDN Basic Rate Interface, that same pair of wires can carry two revenue-producing B channels and possibly one or more revenue-producing services on the D channel.

A Primary Rate Interface that operates at 1.544M byte/sec. can be delivered on two pairs of copper wire and provides either 23 or 24 B channels.

The telephone company can wring a lot more use out of the existing subscriber cable plant. However, it remains unclear how much more, so exact savings cannot be pinned down yet.

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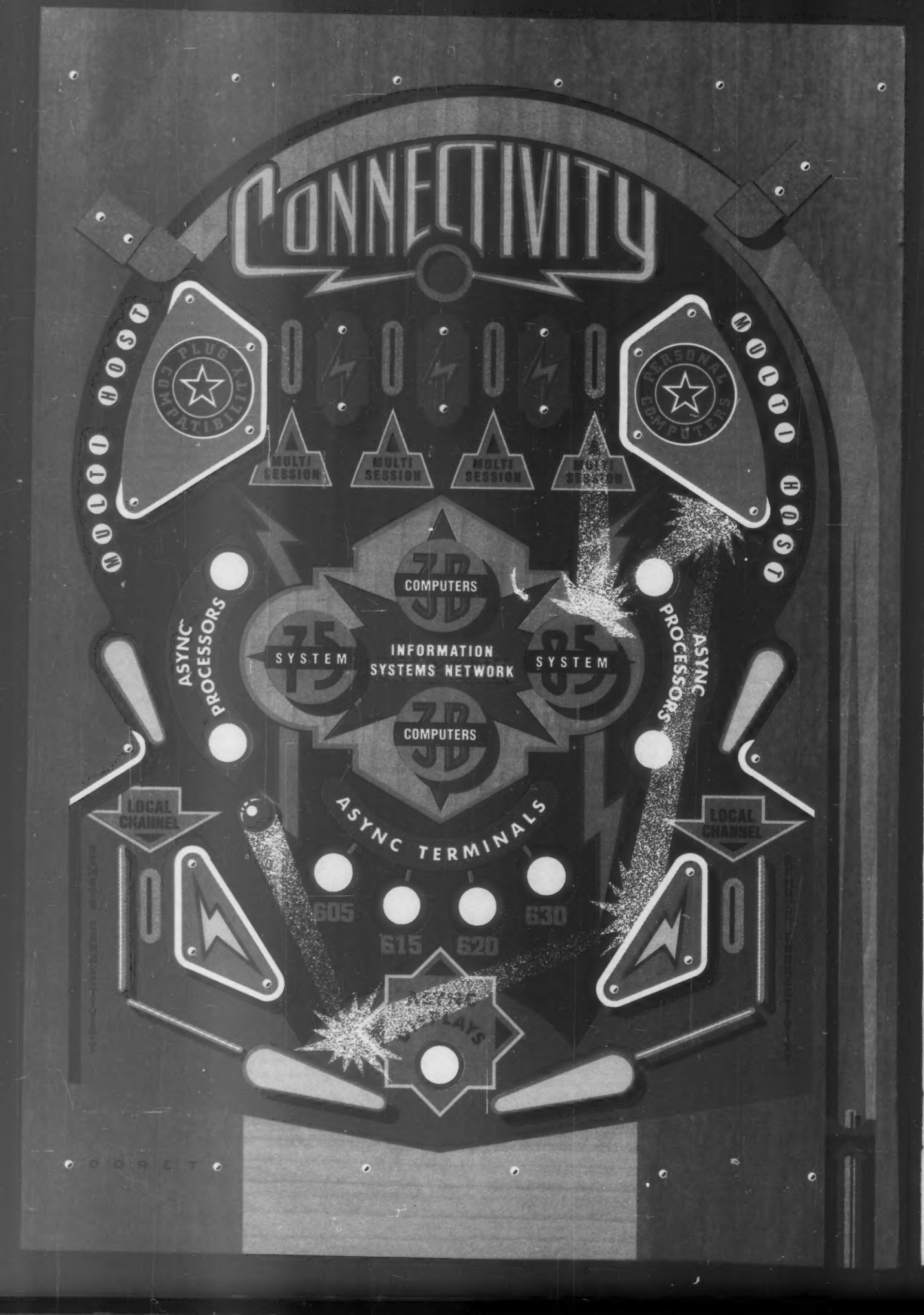
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communications equivalent of in-band signaling).

In an ISDN environment, the information requirements for those higher layer protocols might be carried in D channel signaling messages.

For example, data session parameters might be carried in user information message types on the D channel. The logical session could be built along with the physical connection in ISDN.

This type of integration could greatly reduce the cost of supporting remote data terminals. By allowing those devices to operate on measured rate switched services, rather than on dedicated lines, we could reduce the cost of providing the communication service and increase the host resources a terminal has access to.

All this could be achieved with no degradation in response times and no change in the user's operating procedures.

To achieve seamless interface between a data processing system and ISDN, we would have to build the capability for the host or terminal device to exchange signaling messages directly with the ISDN Exchange.

Tandem Computers, Inc. recently announced its intent to support both ISDN Basic and Primary Rate Interfaces on its computer systems so that ISDN services can be used in place of dedicated facilities to serve transaction terminals like automated teller machines and point-of-sale devices.

IBM's recent announcements in the ISDN area also allude to this type of integration, but we have yet to see it in any deliverable products.

With the ISDN interface integrated in the communications software, ISDN could do a lot more than provide a simple modem interface.

Regulators

ISDN could change the basic economics of providing telecommunications services. For that reason, the Federal Communications Commission and the Public Service and Public Utilities commissions will be involved in tariffing ISDN services. Because of its potential global impact, the U.S. Department of Justice and the U.S. Congress will also undoubtedly have a say in ISDN regulatory structure.

Telecommunications regulation is based on the premise that phone companies are essentially one-product businesses and that dial tone is a tangible good. Given the existing allowable rate-of-return basis for establishing tariffs, if the cost of providing basic service in an ISDN environment is less, its price will be lower and revenue will decline. Quite literally, if telephone companies do the job better, they make less money.

The solution is a structure that provides telephone companies with a financial incentive to deliver the benefits of the technology. One option would be to allow them to sell additional revenue-producing services under the ISDN umbrella and price them like the custom calling packages currently available on electronic switching systems.

Another possibility is the rate cap plan the FCC is discussing for AT&T. But tailoring this structure to the local operating companies will take careful crafting to ensure a justifiable rate for basic service.

THE GREAT promise of ISDN is that it provides a structure and standards in which to implement digital technology in the network.

One can finally begin to see the proof that telecommunication systems have a societal impact. When the FCC proposed waiving access charges on value-added networks — a move that may have increased the cost of using those networks by $4 an hour — the FCC received 10,000 pieces of mail and a threat of legislation.

Also, the issue of privacy is being raised in connection with the New Jersey Bell trial services that include Caller ID for a small number of subscribers.

Caller ID, which displays the phone number of the calling party to the called subscriber, is one of the major service enhancements ISDN will provide.

The American Civil Liberties Union is raising the issue of whether it is a good thing to take away the anonymity users now have when making a phone call.

Living example

The great promise of ISDN is that it provides a structure and standards in which to implement digital technology in the network. The public telephone network is probably the best living example of the successful use of standards.

The great mystery that confronts us with ISDN is, Why should somebody buy it? The impetus to buy might be as simple as the capability to provide two lines and a hold button on a standard telephone line or a cost-effective replacement for a dedicated data communications facility.

The buying decision could also be based on a fresh idea from outside the telecommunications industry. The point is that no one will ever find out unless they give it a try.

The local telephone companies and the long-haul carriers are going to have to bet the ranch on ISDN. But telephone companies have to make the first move. That move is going to take a leap of faith, with no guarantees of success. Once the commitment is made, customers can feel secure in helping fund the development required. •

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MANAGEMENT

TAKING CHARGE

Les Gilliam

Looking out for No. 1

Was it baseball player Satchel Paige who was credited with the adage, "Don't look back — something may be gaining on you"?

In Paige's case, it was Mother Nature and Father Time, trying to end a baseball career. But who is closing in on the MIS manager these days?

In most companies there is only one MIS organization, and, I suspect, the manager rarely thinks about competitors. To him, the competition is a company in the same business.

But that is not so. The information systems manager has his own set of competitors — some of whom may be gaining on him.

One of the greatest dangers to the career of the MIS manager is complacency, a state that results from the false sense of being indispensable. The wise manager knows that company executives could replace him — as well as his entire organization.

Who are these competitors?

The first is the personal computer. A common question among MIS managers today is how to control the widespread purchase of microcomputers. Some companies have developed strict policies, only to find the policies ignored or circumvented.

Some of the best programmers today have titles such as engineer, accountant or attor-

Continued on page 69

Seafirst's motivator

Turnpaugh emphasizes personal interaction

BY STEPHEN JONES
CW STAFF

SEATTLE — The staff at Seafirst Bank's data center braced itself for trouble. The bank's chief of MIS and a gaggle of top information officers made their way through the center recently, stopping to cluster around each employee. With so many executives hovering about, something had to be wrong.

But instead of handing out reprimands or pink slips, Timothy Turnpaugh, executive vice-president of Seafirst's operations group, was delivering $100 checks to the data center employees. Turnpaugh and his lieutenants repeated the visit during the two other data center shifts later that day.

The reason? For one, Turnpaugh says he believes that personal interaction with employees — on both positive and negative issues — is crucial in sparking productivity and efficiency. In this particular case, rewards

Continued on page 70

PROFILE
Timothy Turnpaugh

Position: *Executive vice-president, operations, Seafirst Bank.*
Mission: *Keeping Seafirst's MIS staff connected to the rest of the bank via learning programs, integration.*

Data View

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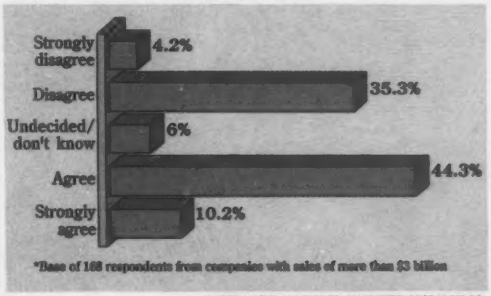

*Base of 168 respondents from companies with sales of more than $3 billion

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CW CHART

DP CERTIFICATION

A look at certificates: What are they worth?

BY NANCY BLUMENSTALK MINGUS
SPECIAL TO CW

In 1962, the Data Processing Management Association (DPMA) introduced certification to the data processing profession. That same year, 570 DP pros became Certified Data Processors (CDP). Since then, more than 40,000 people have been certified by one DP certifying organization. Yet the value of certification still remains in question.

Steve Joffe, vice-president of Source EDP in Paramus, N.J., says that "in 15 years, very rarely, if ever, have I had a manager ask if a person has a certificate." Marc Blessing, director of Compusearch in Cleveland, agrees. "I have never had a manager request someone with a certificate."

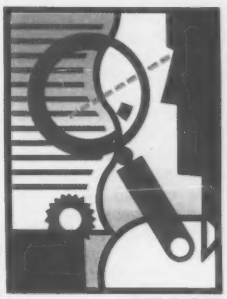
Why then, have 40,000 DP professionals gone through the trouble of certification?

What is certification?

Today, the Institute for Certification of Computer Professionals (ICCP) grants approximately 85% of all DP certificates, according to George Eggert, executive director. The ICCP was formed in 1973 by eight DP associations to further the certification effort started by the DPMA. There are now 14 national and international organizations involved.

The DP professional has four choices for certification from the ICCP: CDP, Certified Computer Programmer, Certified Systems Professional and Associate Computer Professional (ACP).

To gain any of these certificates, candidates must pass a comprehensive test consisting of 225 to 300 questions. An individual has four opportunities to pass all the sections of a given examination.



DAVID FLAHERTY

According to Eggert, of the 4,000 DP professionals applying for certification each year, roughly 35% pass. He adds that about a third of ICCP certificate holders are DP consultants, a third are in insurance and another third are in data processing shops.

But the ICCP is not the only body certifying data processors. Nonmember organizations offer certifications for their DP niches. For example, Certified Information Systems Auditor covers certification for auditors, the Internation-

Continued on page 68

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Hancock joins Pacific Bell

Will help fine-tune network integration plan

BY KATHY CHIN LEONG
CW STAFF

SAN RAMON, Calif. — Pacific Bell has pulled former Wells Fargo Bank NA MIS Director Jack Hancock out of retirement to oversee a newly crafted information systems plan designed to drive the telephone company competitively into the year 2000.

Hancock, 57, the new vice-president of information systems, replaces Steve Welch, who has taken an MIS position as vice-president of support services. Two steps removed from the Pacific Bell president, Hancock reports to Executive Vice-President of Operations Marty Kaplan.

A former major general in the U.S. Army, Hancock retired from Wells Fargo last September with initial plans of writing a book on managing information systems and a historical account of computers in the military.

"At first I wasn't interested in the position at all," Hancock said. "Then I realized that there is a tremendous opportunity to help the company tackle new businesses and new products."

Sources within Pacific Bell said Hancock was tapped after Pacific Bell executives saw how quickly and efficiently Hancock consolidated the information systems operations when Wells Fargo acquired Crocker Bank in May 1986.

Condensing work force

A critical element of Hancock's new position is to consolidate at least four divisions within information systems: planning, development, data processing and administration.

Information systems professionals scattered throughout Pacific Bell in departments such as billing and network software will eventually be merged into the organization, bringing the total number of employees up around 7,000. At Wells Fargo, Hancock's MIS department staff numbered more than 2,000.

Hancock is responsible for the bigger picture of servicing eight million customers, however. Last month, he and a team of Pacific Bell MIS executives put the final touches on a plan called Nesys, designed to carry the firm through the year 2000. The strategy must now be approved by parent company Pacific Telesis Co.

"The plan is an architectural approach to our network and systems," he said. Originally conceived at least five years ago, the Nesys plan calls for integration of voice networks and computer systems. This will require a reorganization of both people and resources.

As he described it, Nesys is an architectural platform using a variety of industry standards that encompass communications, networking and DP. The company has 15 data centers scattered throughout the state and uses a variety of equipment from Hewlett-Packard Co., IBM, Digital Equipment Corp., Tandem Computers, Inc. and others.

"We will continue to operate in a multivendor environment," Hancock said. "But as the plan gets under way, we will have to evaluate each piece of hardware we have to see if it can fit under our new strategy. We don't want to throw what we have away."

While the plan needs to be circulated among other senior executives throughout the organization, Hancock said he would like to see other telephone companies adopt Nesys as a means of bringing standardization to the industry.

"I don't think it would have the magnitude of what General Motors is doing with Manufacturing Automation Protocol," Hancock said, "but you could say it would be similar. Pacific Bell would require vendors to adhere to the specifications of our seven-layer architecture."

According to Hancock, Nesys would integrate voice and data networks under one uniform platform and support Integrated Services Digital Network services along with future Open Network Architecture services.

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Measuring information systems' value

BY DAVID A. LUDLUM
CW STAFF

WASHINGTON, D.C. — Michael Thorsen, corporate director of MIS at Datacard Corp. in Minneapolis, wants to head up an effort to establish a means of measuring the value of company investments.

"Too much of the approach in the past was 'warm and fuzzy,'" Thorsen said. "If everybody felt good about it, you did it."

Thorsen was among nearly 100 executives who attended a conference here recently, titled "Measuring the Business Value of Information Technologies." The conference was sponsored by the International Center for Information Technologies (ICIT), a research, education and consulting firm launched by MCI Communications Corp. two years ago.

While Thorsen hopes to be a leader at his maturing firm, many attendees who represented large companies said they aim to develop measures for information systems comparable to ones the companies use for more conventional investments.

"It's becoming more and more of an issue as expenditures continue to grow," said Robert E. Toone, a senior consultant with the information systems department of Du Pont Co. in Wilmington, Del. "It's getting to be a sizable part of the company's expenditures. And it's not just the MIS department; there are outside expenditures as well."

The conference incorporated a half dozen presentations conveying a diversity of approaches to the subject. Peter G. W. Keen, executive director of ICIT, suggested managers select an approach and pursue it diligently rather than worrying about which one is best.

Measuring management

Paul A. Strassmann, an independent consultant based in New Canaan, Conn., presented his method for determining the value of information technologies whose costs are added to overhead expenses. Since these systems are aimed at improving the management of a business, they should be measured by changes in "return on management" rather than by traditional measures such as return on investment, he said.

Strassmann said he considers all administrative activities as management and determines the return they generate by dividing the value they add to a firm by their cost.

On a more empirical level, Charles McCaig, senior vice-president of Mutual Benefit Life Insurance Co. in Newark, N.J., described how he convinced the company's top managers to drop plans to cut his department's budget by 20%.

McCaig said the volume of processing, coding and end-user computing supported by the department was growing quicker than its spending, indicating that the spending was helping to build a corporate asset.

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Certificates

FROM PAGE 65

al Association for Computer Systems Security grants certificates for systems security personnel and the Office Automation Society International handles office automation.

To add to the confusion, several training schools and colleges issue DP certificates.

All this complexity bewilders managers and DP professionals.

Pacific Mutual's Roberts

Employees wonder which certificate to get, and managers wonder if any are reliable. "Today," says William A. Roberts, vice-president of information systems at Pacific Mutual Life Insurance Corp., "a certificate does not play a major part in the hiring or promotion process, [mainly because] I don't see what a certificate is supposed to tell me.

"If it could tell me my people were state-of-the-art, [I might] reconsider," Roberts adds.

"You're not dealing with the same type of vehicle as a CPA," Joffe says. "With a CPA, there is a definable knowledge, and there are skills involved in balancing numbers." There are no such standards within the DP profession, so a certificate does not guarantee someone can perform the job.

What a certificate does show, however, is a commitment to the profession. According to Bob Clark, corporate manager of technical education at Computer Task Group, a Buffalo, N.Y.-based computer consulting company, certification "doesn't really say you're an expert, but the fact that you have one shows you look at DP as a career, not just a job."

"It's certainly an indication of a person's commitment to continuing career development," Compusearch's Blessing adds.

Recognizing certification

The continuing education aspect is actually part of what's selling certification to DP management. Companies are starting to recognize certification in several ways. At a minimum, companies that support certification will pay for the exam. Other companies will pay for textbooks and refresher courses, just as they do for any continuing education. A few organizations formally recognize those who have passed. At 3M Co., for instance, according to lead analyst James Ritschel, "Those who pass get companywide recognition for their accomplishment."

The highest form of recognition comes from companies such as Merchants Insurance in Buffalo, which gives bonuses to employees who pass.

Nick Boccolucci, Merchants' assistant vice-president of human resources, says, "We [motivate] our employees with a bonus of $150. We also have what is known as 'The Wall of Fame,' where designations [such as CDP] are posted on the wall, with the certificate holders' names listed below." The wall is in the main lobby of the firm's headquarters. Boccolucci adds, "It's the visibility and employee recognition that we're after."

Support for the continuing education aspect of certification is becoming more important, because all the certificates issued by ICCP, and many others, require recertification. That is, every three years, a certificate holder must become recertified by showing proof of a certain level of continuing education courses, seminars, meetings and so on.

If they do not, they must retake the certification exam or forfeit the right to use the certificate designation. Critics of certification in the past have complained that in the continually developing field, certificate holders were stagnating. Ironically, critics now question the high number of hours required to recertify.

Merchants Insurance's Boccolucci

The future of certification

The past 26 years have been stormy ones for certification advocates, and the future doesn't look much brighter. But there are some positive signs. Probably the biggest boon to the certification movement came in January, when the American Council on Education (ACE) came out with the recommendation of awarding college credit to some certificate holders. According to ACE's guidelines, up to 36 credit hours can be awarded to those who received a CDP after 1982 and 24 credits to ACP holders who pass with 68% or higher.

It's up to an individual school to award credits based on recommendations, but if the majority of them do, the number of people requesting certification could increase substantially.

Another driving force behind certification is the end-user computing revolution. As a growing number of users start listing DP skills on their resumes, managers may need better ways for differentiating them from DP professionals. ICCP's Eggert says, "There's going to be some pressure for proof when you say you can do a job for a company."

The future of certification will also depend on acceptance by employees and managers. Source EDP's Joffe predicts limited success. "I don't see people caring that much about it today, and I don't see much of a change for tomorrow." However, Pacific Mutual's Roberts says, "If a case could be made that certification would work to the advantage of Pacific Mutual, I am open to reconsideration."

Blessing views certification differently. "It's not an indication of what type of contribution a person can ultimately make to an organization, but it is a positive thing. I would encourage someone to get one."

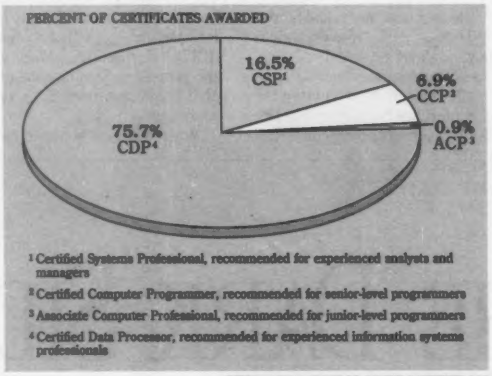
Compusearch's Blessing

The several thousand DP professionals applying for certification each year obviously agree. But only time will tell if certification can become the hallmark for DP, as it has for accounting. Until then, as Computer Task Group's Clark points out, "At a minimum, it's a marketing tool."

Blumenstalk Mingus is a free-lance writer based in Buffalo, N.Y.

Certifiably professional

The Institute for Certification of Computer Professionals has awarded approximately 43,600 data processing certificates since its inception in 1962



[1] Certified Systems Professional, recommended for experienced analysts and managers

[2] Certified Computer Programmer, recommended for senior-level programmers

[3] Associate Computer Professional, recommended for junior-level programmers

[4] Certified Data Processor, recommended for experienced information systems professionals

INFORMATION PROVIDED BY THE INSTITUTE FOR CERTIFICATION OF COMPUTER PROFESSIONALS
CW CHART

CALENDAR

JUNE 12-18

International Symposium on MCAE: Better Products Sooner (Slashing the Cost of Engineering Change). Boston, June 12-14 — Contact: "CAD/CIM Alert," 824 Boylston St., Chestnut Hill, Mass. 02167.

Computers in Marketing Conference. Chicago, June 12-15 — Contact: Conference Department, American Marketing Association, 250 S. Wacker Drive, Chicago, Ill. 60606.

Digital Technology Spanning the Universe. Philadelphia, June 12-15 — Contact: IEEE Office, Moore School of Electrical Engineering, Room 209, University of Pennsylvania, Philadelphia, Pa. 19104

VM Software Annual User Conference. Washington, D.C., June 12-15 — Contact: VM Software, Inc., 1800 Alexander Bell Drive, Reston, Va. 22091.

ACM/IEEE Design Automation Conference. Anaheim, Calif., June 12-16 — Contact: Design Automation Conference, Suite 102, 7490 Clubhouse Road, Boulder, Colo. 80301.

Cinteract, Cincom's International User Conference. Cincinnati, June 12-16 — Contact: Cincom Systems, Inc., 2300 Montana Ave., Cincinnati, Ohio 45211.

Government Management Information Sciences Conference. Reno, Nev., June 12-16 — Contact: Ron Wolff, Director, Management Information Services, P.O. Box 11130, Reno, Nev. 89520.

Key/Master Users Conference. Norwalk, Conn., June 12-16 — Contact: Steve Rosen, TSI International, 295 Westport Ave., Norwalk, Conn. 06856.

North American Paxbase Users' Conference. White Plains, N.Y., June 12-16 — Contact: Linda Rose, CGI Systems, Inc., One Blue Hill Plaza, Pearl River, New York. 10965.

CAP International's 1988 European Electronic Printing Industry Conference. Amsterdam, June 13-15 — Contact: Jean O'Toole, Conference Manager, CAP International, Inc., One Snow Road, Marshfield, Mass. 02050.

Conference of The Association of Human Resource Systems Professionals (HRSP), "Human Resource Systems. . .The Strategic Advantage." San Francisco, June 13-15 — Contact: HRSP, Inc., P.O. Box 8040-A202, Walnut Creek, Calif. 94596.

Dataquest Display Terminal/Graphics and Imaging Conference. Monterey, Calif., June 13-15 — Contact: Dataquest, Inc., 1290 Ridder Park Drive, San Jose, Calif. 95131.

DB2 Tools Symposium. Los Angeles, June 13-15 — Contact: Digital Consulting, Inc., 6 Windsor St., Andover, Mass. 01810.

IBM/DEC Computer Security Conference. Washington, D.C., June 13-15 — Contact: Phyllis St. Martin, Computer Security Institute, 360 Church St., Northboro, Mass. 01532.

Systems Forum '88. San Francisco, June 13-15 — Contact: PC Tech Journal, Systems Forum, 10480 Little Patuxent Pkwy., Columbia, Md. 21044.

International Conference on Testing Computer Software. Washington, D.C., June 13-16 — Contact: Conference Staff, U.S. Professional Development Institute, 1734 Elton Road, Silver Spring, Md. 20903.

MUMPS Users' Group 17th Annual Meeting. New Orleans, June 13-17 — Contact: Maria Lourdes Garcia, Director of Marketing, MUMPS Users' Group, Suite 510, 4321 Hartwick Road, College Park, Md. 20740.

Electronic Data Interchange and Bar Coding in The Textile/Apparel Industry. Raleigh, N.C., June 14-15 — Contact: Automatic Identification Manufacturers, Inc., 1326 Freeport Road, Pittsburgh, Pa. 15238.

Voice '88 Conference & Exposition. Dallas, June 14-16 — Contact: Information Publishing Corp., P.O. Box 42375, Houston, Texas 77242.

Rochester Forth Conference on Programming Environments. Rochester, N.Y., June 14-18 — Contact: Lawrence P. Forsley, Conference Chairman, Institute for Applied Forth Research, Inc., 70 Elmwood Ave., Rochester, N.Y. 14611.

Planning and Selecting a State-of-the-Art Financial Information System. Hartford, Conn., June 15 — Contact: Laura Manning, Boston University, Metropolitan College, 755 Commonwealth Ave., Boston, Mass. 02215.

Workgroup Computing — Current Status & Outlook. New York, June 15-16 — Contact: Brandon Managing Information Programs, 1775 Broadway, New York, N.Y. 10019.

Telco Research Annual Forum '88. Nashville, June 15-17 — Contact: Telco Research, 1207 17th Ave. S., Nashville, Tenn. 37212.

Gilliam

CONTINUED FROM PAGE 65

ney. Budgets often include sizable sums to buy PCs under such categories as office equipment or laboratory instruments.

The second competitor is the service bureau industry. Many service bureaus provide quality service. The service bureau alternative may seem appealing when the in-house computing environment is one of continual controversy, cost increases and user dissatisfaction. It certainly is simpler for an executive to manage a contract than to manage an MIS organization.

Every MIS manager should, from time to time, repeat the words "facilities management." There are many such organizations out there that can convince executives that DP headaches would be gone under a facilities management contract. Those offering facilities management services include some large MIS departments spun off as separate corporations and challenged to produce a profit, sometimes through management of other companies' information systems.

Does the user have a choice as to who does his application system development work? If the quality, responsiveness and cost of such services are unsatisfactory, the MIS manager can expect changes or much discomfort. One of the alternatives users are pursuing is to do their own programming, on either the mainframe or their PCs.

Wrap it up, I'll take it

Similarly, more and more users seek the packaged software alternative. The user may see the package listed in a catalog or advertised in a publication. For larger applications, it may be a package that was created by a company in the same industry. Immediate access to a package, even if it is less than what is desired, is often worth the price to the user.

Or the user can contract with a software house to develop a custom package if the product cost, quality and availability are better than the in-house organization can provide. Of course, an alternative to the MIS manager's services is to do the work manually. Users often prefer this if they distrust MIS people and fear losing control of their own work.

The MIS manager has personal competitors also. They include his peers who manage other departments in the company. It is natural for him to be compared with other managers, especially when opportunities for bonuses or promotion arise.

The most feared competitor of the MIS manager is the person who will replace him if his performance is less than acceptable. He should remember that such a person is available and able. Since most companies operate for profit rather than charity, executives will not hesitate to make a change to protect their own reputation, bonus, or chance for advancement.

What can be done to combat these competitors? First, the manager should perform an audit of his personal strengths and weaknesses. He should find out what his superiors see as the areas most needing improvement and place these at the top of the list. A plan to overcome the weaknesses through training, effort or delegation to others with special skills should be developed.

Next, he should determine how the MIS department stands with every user department. He should find out what his group is doing well and what is being done poorly. He should make sure every user knows of his goal to improve services. Then, with the involvement of the key people in MIS, a plan should be developed to attack the complaint list.

THE MOST FEARED competitor of the MIS manager is the person who will replace him if his performance is less than acceptable.

A frequent mistake is to consider PCs the enemy. Why not just add PCs to the list of alternatives the information systems department has to solve users' needs? After all, PCs are a cost-effective solution to a certain business problems.

Another suggestion is to involve the user more in evaluating the alternatives. Over the past two years, there has been a tremendous improvement in the user's data processing knowledge. The user should be considered a partner, not a computer illiterate or an adversary.

Executives think in terms of the bottom line, and so should the information systems manager and user departments. Every DP service and application should be judged by its effect on the company's success. Saying no is often a very profitable decision.

User problems will not be solved overnight. But starting is half the battle, if the user knows that a priority has been placed on customer satisfaction.

The successful MIS manager treats the user as a customer who has the option of taking his business elsewhere. If the MIS manager does not have this attitude, then he should be aware that there are competitors who may be gaining on him — and are ready to replace him.

Gilliam is president of Gilliam Associates, a computer and management consulting firm based in Ponca City, Okla.

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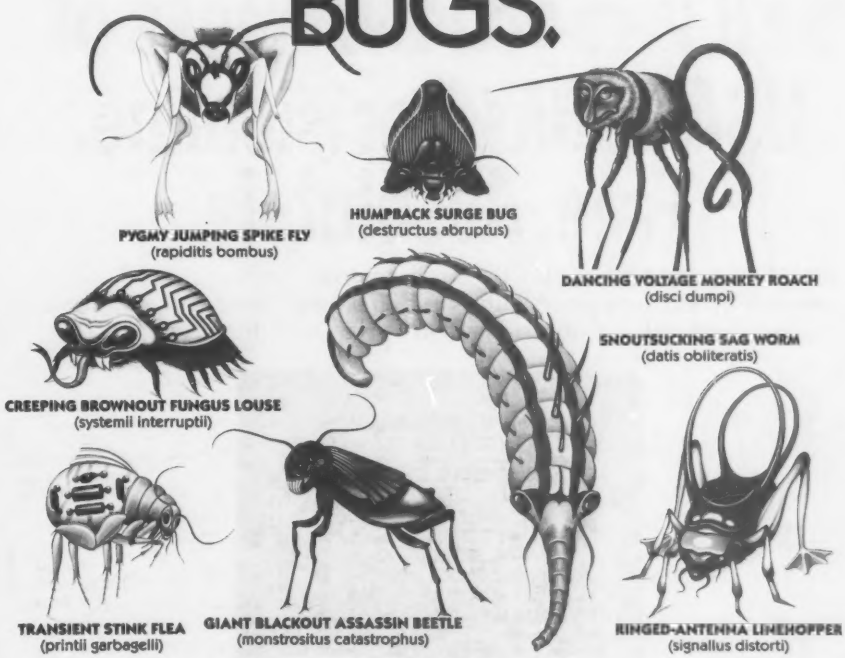

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Seafirst

CONTINUED FROM PAGE 65

were given to employees after the data center delivered 100% of all the overnight information requested from branches and the main office for a month.

"We made a big deal out of it because fulfilling that service is important to the overall operation of the bank," says Turnpaugh, an intense, rangy Midwesterner who came to Seattle in 1984. "Somebody asked, 'What happens if we do this again?' and I said, 'We'll be back with more checks.' "

Keeping Seafirst's MIS staff connected to the rest of the bank is one of Turnpaugh's chief concerns. Instead of having programmers and technicians working in a cloistered data processing environment, Turnpaugh wants them to be intimately aware of the dollars-and-cents business of Washington's largest bank.

To promote that knowledge, Turnpaugh helped implement a plan that requires each MIS employee to understand what happens to a customer's check after it is deposited at a Seafirst branch.

Instilling business sense

"When you get down to the programmer ranks at most companies, the people understand how to back up and recover data, but they don't have the slightest clue about what business their employer is in," Turnpaugh says. "We want people to know how a particular program impacts the total business of the bank and to be proud of that."

The indoctrination process, which Turnpaugh says could be applied to companies in any industry, consists of a 13-week "boot camp" for new employees that covers the bank's structural and procedural operations. Prospective and junior MIS managers take part in the bank's "Management Academy" — a series of courses that cover production and project management, group leadership and accounting. "If you don't understand accounting," Turnpaugh notes, "you don't understand how the bank works."

A clue to why Turnpaugh emphasizes familiarity with the bank's daily business may be found in how he got his start in the information industry. As Turnpaugh tells it, it was an attraction to the fundamentals of banking, not MIS, that ultimately led him to Seafirst.

Turnpaugh had little interest in computing, but he always dreamed of being a banker. "I spent my first two years in the industry running a credit service operation and got into computers almost by accident. I never took a computer course in my life," he says.

But during a 12-year stint at Chicago-based Continental Illinois Corp., Turnpaugh rose to the top of the bank's MIS operations.

Since coming to Seafirst four years ago, Turnpaugh has become chief of the operations group and assumed the executive status that goes along with the job. In addition to overseeing MIS, he is responsible for branch and properties operations, purchasing and payment processing. He reports directly to Seafirst's chairman of the board.

Turnpaugh takes a no-nonsense approach to MIS, and while eager to stroke accomplishment, he says he has little tolerance for failure. With a motion similar to a baseball umpire's "you're out" signal, he condemns any form of wastefulness by throwing a cocked thumb over his shoulder and flatly stating, "It's outta here."

Turnpaugh's intensity tends to rub off on his staff.

"Those people that understand Tim's expectations work well, and those who don't understand those expectations end up not working for him," says William Browne, senior vice-president and manager of the systems services division.

But if Turnpaugh sometimes rules with an iron fist, he is quick to don a velvet glove, too. "He can be impatient in expecting and demanding results, but he does it in such a way that he gets the results he wants. He's a great motivator," says Bill Anderson, senior vice-president of the technical services division.

Staff reduction necessary

Turnpaugh's zealous drive to keep operating costs consistently down has had a positive effect on the bank's bottom line, but controlling expenses has meant firing some MIS workers. The elimination of an entire Honeywell, Inc. computer system, a complete restructuring and an increase in productivity has resulted in a 50% reduction in the work force since Turnpaugh came on board.

As recently as March, 40 workers in systems development were laid off.

Colleagues say Turnpaugh overcomes what can sometimes be a tough-guy exterior by often getting down in the trenches with employees. Turnpaugh makes a point to meet at least once every quarter with each of the 1,350 people who work in the 10 operating divisions he oversees.

"Employees know that he's an executive vice-president who reports to the chairman, but they also know that he's willing to sit and B.S. with them and be one of the guys; he's 'Tim' to everybody," Anderson says.

But Turnpaugh knows that getting too chummy with employees can lead to problems. "This isn't a democracy; I always have the last word," Turnpaugh maintains. "But every person has the unalienable right to ask 'why.' They may not like the answer they get, but at least they know the reason for the decision."

And the more bonus checks that Turnpaugh has to hand out, the more chances workers will have to shoot the breeze with the boss.

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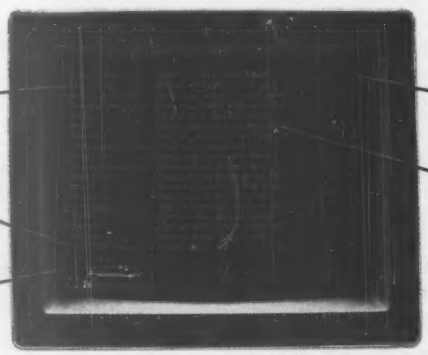
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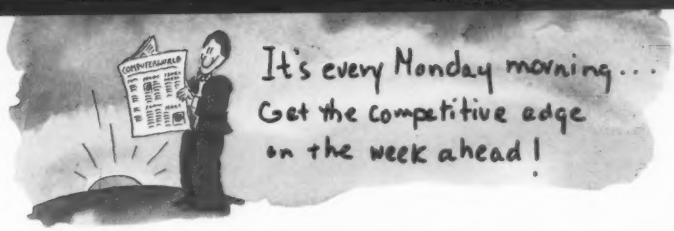

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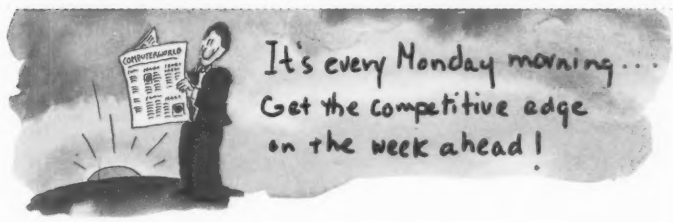

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INDUSTRY INSIGHT

William Zachmann

Hold that apocalypse

The industry today has become the site of what resembles a truly cosmic struggle. Like the Manichean struggle between the forces of Orzmud and Ahriman, vendors are choosing sides between the forces of light and darkness.

Which is which, however, depends very much on whom you ask.

The recent announcement of the founding of the Open Software Foundation (OSF) to promote a Unix standard independent of AT&T is an example. It represents a mixture of good and evil, light and darkness, truth and illusion and a web of alliances the complexity of which hasn't been seen since the days of the Borghias during the Italian Renaissance.

No matter how certain of themselves individuals already committed to the struggle may be, telling the good guys from the bad guys in this one isn't nearly as easy as you might think. That seven of the largest and most powerful vendors are willing to ante up $90 million to fund this thing, however, is an indication of how large the stakes are in this particular struggle.

IBM, DEC, Hewlett-Packard, Apollo, Honeywell Bull, Siemens and Nixdorf have responded to AT&T's recent closer alliance with Sun Microsystems by trying to seize the initiative with regard to future development of Unix standards.

Continued on page 74

'Look-and-feel' decision looms

Copyright Office judgment could clarify Lotus infringement suits

BY TORREY BYLES
SPECIAL TO CW

The U.S. Copyright Office is expected to reach a decision this week that may help resolve the critical distinction between "look-and-feel" screen display protection and source-code copyrights.

At issue is whether a software product may be fully copyrighted with one unitary registration or by parts with multiple registrations. The distinction is critical to software vendors, because many have sought separate protection for screen displays in addition to protection for programming code.

The decision is expected to resolve ambiguities that arose with such cases as Digital Communications Associates, Inc. (DCA) vs. Softklone Distribution Corp. and Lotus Development Corp. vs. Mosaic Software, Inc. and Paperback Software International. The decision will also conclude an industry forum on the issue that began with a public hearing last September in Washington, D.C.

Split opinion

The software industry is mixed on the issue. Thirty-five entities, including vendors and trade associations, responded to the September hearing, and their input was far from unanimous. Participants included such major industry shapers as Lotus, IBM, Apple Computer, Inc., Microsoft Corp., ADAPSO, the Institute of Electrical and Electronics Engineers, Inc. and the Information Industries Association.

Representing the two basic poles of the dispute were Apple and Lotus.

In 1986, Lotus filed for additional copyright registrations of screen displays for both its 1-2-3 and Symphony products. The Copyright Office ultimately denied the registration requests, stating that the displays were already covered by Lotus's earlier registrations of the programs.

This convinced attorneys at Lotus that a single registration was adequate for copyright protection — a view they support today.

"Think if a film producer had to register all the components of the film that are recognized with an Oscar," said Thomas M. Lemberg, vice-president and general counsel of Lotus. "It would be an administrative nightmare."

Apple contends that because there are many authors involved in a single software program — such as screen display designers as well as programmers — there should be many copyrights even for a single software product.

Apple emphasized the multiple-authors point because the firm is currently developing in-

Continued on page 76

Japanese chip firms fly again

BY LORI VALIGRA
IDG NEWS SERVICE

TOKYO — Japanese semiconductor companies are in quite a different position than they were almost a year ago, when the U.S. government imposed 100% duties on laptop computers and other items containing certain Japanese semiconductors.

Government-imposed production limits issued to Japanese chip makers have been eased, capital equipment purchases and production plans are up sharply and Japan is once more on an export drive.

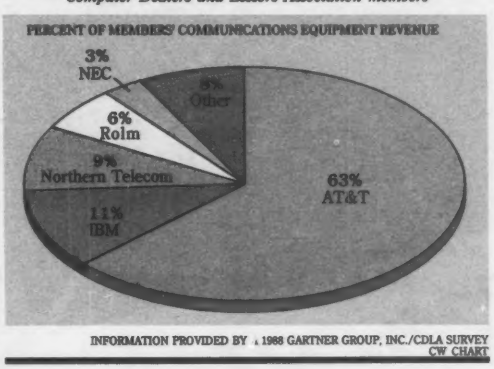
The semiconductor trade dispute with the U.S. has, ironically, turned out to be a blessing in disguise for Japanese manufacturers. Production lim-

Continued on page 72

Data View

Leasing big names

AT&T provides the majority of communications equipment leased by Computer Dealers and Lessors Association members



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CW CHART

HP to resell Zenith laptops

BY JAMES A. MARTIN
CW STAFF

For Zenith Data Systems microcomputers, "the quality goes in before the name goes on," according to the famous ad slogan. But for some Zenith laptops, the name that goes on will be Hewlett-Packard Co.

HP and Zenith announced last week an agreement in which HP will act as an OEM for Zenith's Supersport 286 laptop. HP will buy an unspecified amount of Supersports, customize them to conform in appearance to HP's Vectra PC line and resell them with the traveling corporate sales force in mind. HP is expected to begin selling the Zenith Supersport under an HP label later this year.

Although HP buys products from other vendors on an OEM basis, this is believed to be the first incident in which the Palo Alto, Calif.-headquartered firm has agreed to act as an OEM for another vendor's microcomputer.

"We wanted a 286 laptop for the corporate environment," said Terry Eastham, HP's portables program manager. The Supersport fit HP criterion for reliability and quality, the company said.

Currently, HP offers the Portable Plus, which uses read-only memory (ROM)-loaded software

Continued on page 73

Success hasn't spoiled Silicon Graphics

BY JULIE PITTA
CW STAFF

MOUNTAIN VIEW, Calif. — To celebrate Chief Scientist Greg Chesson's first birthday as a Silicon Graphics, Inc. employee, his colleagues, led by Chairman James H. Clark, attacked Chesson with water pistols until his clothes were drenched.

That kind of scene is not likely to be repeated at Silicon Graphics. Back in 1982, the dozen or so employees there were a close-knit team working long hours to keep a start-up afloat. Today, the company's payroll totals nearly 700, and the intimacy of the early days is mostly gone.

What has remained, however, is a loose atmosphere that allows creative minds to flourish. "The corporate culture of every company is the product of the seeds planted in the beginning," Chesson explains.

Silicon Graphics is a technology company. And like a number of technology-based companies, its roots are in academia. As a Stanford University professor, Clark had commenced a research project in early 1982 that he hoped would propel him into the private sector.

Roots

Clark's project was to design a geometry engine to power sophisticated graphics — one that could compete with, and even surpass, Japanese technology. To show off the invention, Clark's team built a system

Chairman Clark

around the component that became the forerunner of Silicon Graphics' first product — a graphics workstation that enabled three-dimensional imaging.

By June of that year, Clark had completed a business plan, secured financing and rented a couple of offices not too far from the university. His colleagues on the research project — another professor and four of their students — joined him. The "Stanford Six," as they are known around Silicon Graphics, are still there today.

"Being an academic was a hard thing for me," Clark re-

Continued on page 75

INDUSTRY WEEK IN BRIEF

Another high-level **Management Science America, Inc. (MSA)** executive left the company last week. Tania Amochaev, a vice-president of strategic planning, left to become chairman of **Natural Language, Inc.**, a Berkeley, Calif.-based developer of natural language front-end software. Amochaev had headed **Comserv Corp.**, a manufacturing software vendor acquired by MSA in 1986.

Cipher Data Products, Inc., just days after filing a patent infringement suit against **Archive Corp.** [CW, May 30], won a similar suit against **Wangtek**, a division of Rexon, Inc. A U.S. District Court jury in San Francisco ruled that Cipher's quarter-inch cartridge tape drive patent was valid and that Wangtek had infringed on the patent. Wangtek plans to appeal the decision. The case marked the first time San Diego-based Cipher defended a patent in court.

Although a Cipher spokesman said the company believes its suit against Archive is comparable, Costa Mesa, Calif.-based Archive quickly announced that it "does not feel that this jury verdict has materially changed our view of Cipher's patents."

Dell Computer Corp. is ready to go public and has filed a registration statement with the Securities and Exchange Commission for an initial public offering of 3.5 million shares of its common stock. No price range has yet been established for shares of the Austin, Texas-based personal computer maker.

Comdisco, Inc. will expand its disaster recovery business to Europe by acquiring UK-based **Recovery Operation Centres Ltd.** (ROC) for an undisclosed sum. ROC, formed in 1980, has about 400 disaster recovery clients in England.

Advanced Micro Devices, Inc. will join forces with West Germany's **Siemens AG** to develop, produce and sell chip sets for Integrated Services Digital Network (ISDN) applications. The two companies have several similar technology-sharing agreements for other semiconductor applications. The 12-year ISDN agreement's first product will be a chip set containing 15 circuits, most of which are contributed by Siemens.

Encore Computer Corp.'s financial woes appear to have eased; the Marlboro, Mass., firm recently reported its third consecutive profitable quarter. Revenue for the parallel processing system maker was $9 million, a 156% increase over the same period in 1987, while net income came in at $649,000, or 3 cents per share, compared with a net loss of $1.7 million, or 8 cents per share, a year ago.

Japan

CONTINUED FROM PAGE 71

its sent demand for certain now-scarce chips — along with their prices — soaring, resulting in a boost in corporate sales and earnings figures.

The phenomenon is not new; restrictions on Japanese exports historically have tended to strengthen the position of Japanese industry.

"This goes back to the 1960s, when Japan first got into bilateral trade disputes," explained Richard C. Hanson, editor and publisher of the *Japan Financial Report*, an independent economic journal published in Tokyo. "It happened with steel exports when the United States wanted Japanese restraints in the 1960s and 1970s. Japan raised prices, and U.S. users ultimately paid the price."

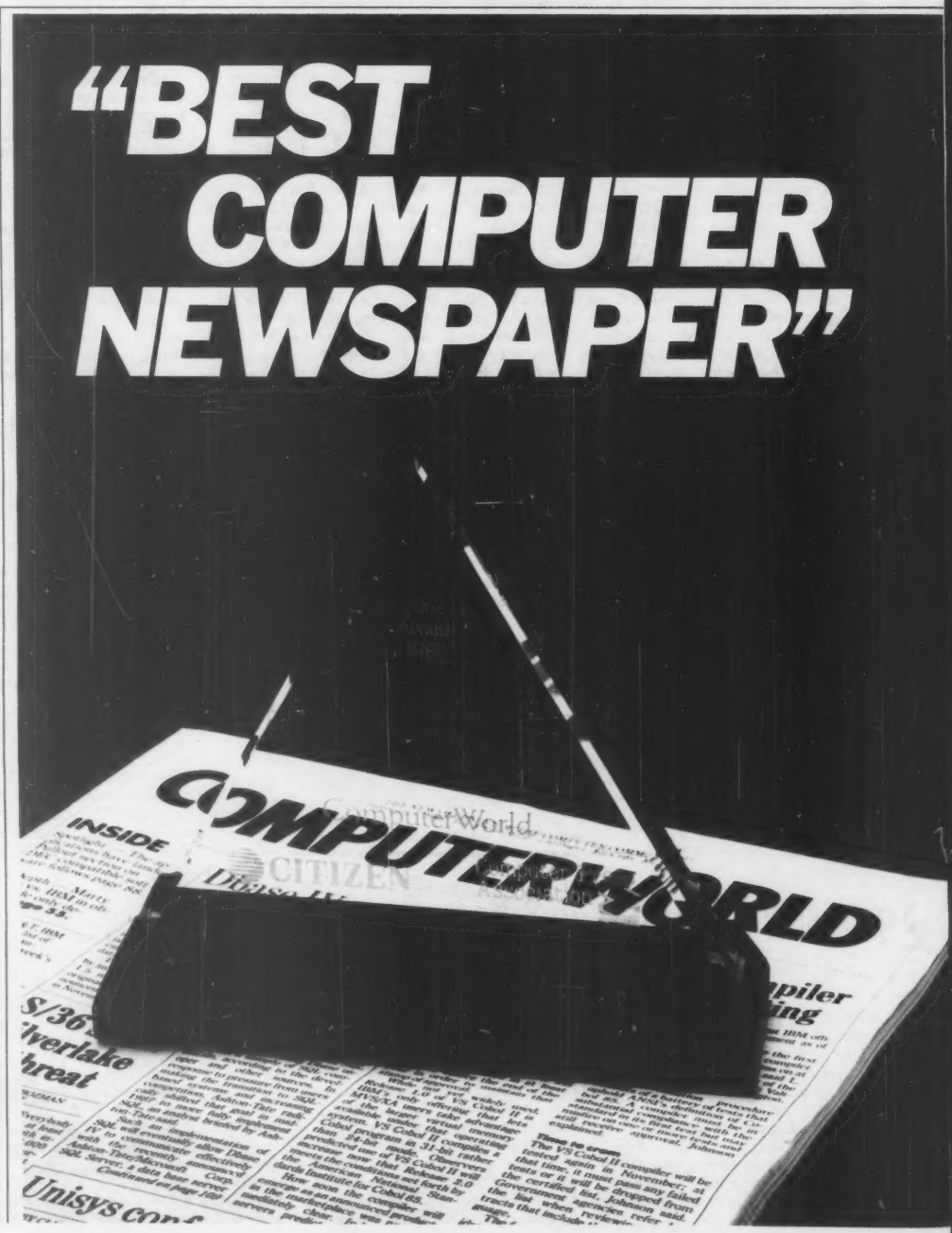
Hanson explained that what happened in the steel industry was re-enacted in the automobile and semiconductor industries. He added that because Japanese semiconductor producers also make electrical equipment and electronic products, they are too big to be hurt by sanctions.

"They may have some setbacks, but ultimately restrictions raise prices and, thus, raise profits," he noted.

According to figures released in February by Japan's Ministry of Finance, chip exports to the U.S. rose 19.2% to $1.56 billion in 1987, while imports were up only 8.3% to $953.8 million. That trade imbalance was up 41.4% from 1986.

The imports leveled off after hitting a peak in last year's April-June quarter, when imported chips accounted for 12.6% of the purchases made by Japanese semiconductor user companies, according to a survey of 63 buyers made by the Japan's Ministry of International Trade and Industry (MITI).

Production is on the rise again, as are investments in plants and equipment. Capital spending will increase an average of 30% at the four big chip makers — Mitsubishi Electric Corp., NEC Corp., Oki Electric Industries Co. Ltd. and Toshiba Corp. MITI projected a 44.1% rise in the output of the 1M-bit dynamic random-access memory chips to 43.6 million units from from the previous quarter and a 28.4% rise to 56 million next quarter.



Swapping bytes for a bite of the action

BY J. A. SAVAGE
CW STAFF

SAN FRANCISCO — The economic burden of data processing can run a fledgling company into shark-infested waters. This inspired OBS Ventures, a subsidiary of On-Line Business Systems, Inc. (OBS), to offer lifeboat computer services in exchange for a chunk of the start-up company's equity.

Since April 1987, 10 companies have swapped equity or other debt instruments in exchange for the use of OBS's two IBM 3081s and Amdahl Corp. 470/V8 mainframe service under the plan.

"The second most common commodity [needed by start-ups] is information services," said Jeffery Stein, OBS's president. Stein said his two criteria are that the company is a good investment target and needs an IBM mainframe. An OBS investor brochure suggests it also helps to have at least $5 million in annual sales.

Stein, whose private company offers remote computing, custom data processing, custom software and vertical data processing services, said the debt-for-services swap is the most promising and profitable of all the services. OBS has been in business for 19 years.

OBS Ventures has come full circle in most of the companies in which it had a stake, Stein said — meaning that OBS Ventures divested itself of the companies in less than a year.

The first firm to swap service for equity was San Francisco-based Tesseract Corp. Gary Durbin, executive vice-president, said Tesseract came up with the idea of the swap in the early 1980s when the company was changing from a development to a product orientation. At that time, Tesseract was spending $35,000 a month on computer services.

OBS Ventures traded $150,000 worth of computer services for equity "when the company really needed working capital," according to Durbin. "That got us part of the way," he said. The next year, he decided he needed $2 million and appealed to the venture capital community, which raised the money and bought out OBS's share of Tesseract. Tesseract still buys computer services from OBS.

In another case, after giving Koch Systems Corp. — a mortgage-backed securities firm — $750,000 in exchange for 1% to 4% of the company, the other venture capitalists in the deal backed out and left OBS to either duck out or acquire the company. Stein said Koch moved into his offices in May and that the acquisition will be complete sometime this month.

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Infotron nixed Memotec buy-out

CHERRY HILL, N.J. — Memotec Data, Inc., a Canadian data communications company, last week disclosed that it was rebuffed in what it called a friendly attempt to acquire Infotron Systems Corp., based here, at a price that would have been substantially above the latter's trading price or book value.

In a filing with the Securities and Exchange Commission, Memotec, which currently owns 6.5% of Infotron, said it is unsure how it will proceed. An Infotron spokeswoman said Infotron wishes to remain independent.

Memotec said it bought 331,100 Infotron shares on the open market between March 8 and May 31 at prices that ranged between $8.82 and $13 per share for a total of $3.2 million. The purchase would have strengthened Memotec's hand in acquisition discussions, the firm said.

Memotec Chairman Eric Baker proposed a negotiated acquisition in a letter dated April 25 to Infotron Chairman Robert Percell, according to the filing. He said Memotec was willing to pay a price which would represent a premium over Infotron's current price, its 18-month high or book value. Infotron shares closed at $10.75 that day; they traded at $4.25 in November 1987.

Laptops

CONTINUED FROM PAGE 71

and no internal disk drive, as well as two Portable Vectra models. All three are based on the Intel Corp. 8086 microprocessor. The Portable Plus was introduced in 1985, the Vectra models in 1987.

Eastham said HP's OEM agreement with Zenith does not preclude any efforts by HP to develop laptops on its own.

A spokesman for Zenith said the Glenview, Ill.-based company sells its microcomputers to a number of OEM customers, including Control Data Corp., and that the HP agreement is nothing unusual. He said HP has provided peripherals and support in the past for major Zenith customers, including the Internal Revenue Service, under cooperative agreements between the two computer makers.

HP has not yet determined what it will call the Supersport under the HP label.

Zachmann

FROM PAGE 71

Proposing themselves as champions of a truly open standard, they aim to preempt AT&T and Sun's efforts to be the leaders of the Unix pack.

Many analysts have been quick to denounce OSF as a mere exercise in spreading fear, uncertainty and doubt over the future of Unix. They view the move as an effort on the part of vendors to defend the semi-monopoly margins they are able to obtain from their proprietary system and operating system architectures of the past.

OSF from this perspective is viewed not merely as a cynical effort to rain on AT&T and Sun's parade but as an effort to muddle matters enough to retard Unix acceptance in general. The operating motto of OSF, according to this view, is "If you can't beat 'em, join 'em — just enough to mess 'em up."

It's hard to entirely discount this perspective. After all, it was only last fall that DEC's vice-president of research, Sam Fuller, denounced Unix as a stupid plot on the part of the U.S. government to reduce the computer industry to the lowest common denominator and thus hand matters over to Japan.

In fact, aside from Apollo, which has long been primarily a Unix vendor, none of the sponsors of OSF has distinguished itself as a particularly warm and sincere supporter of Unix. And Apollo's participation might be dismissed as an effort to oppose anything having to do with archrival Sun.

For real

Still, there is good reason to see this as more than just a "Stop Unix" — or "Stop AT&T and Sun" — move. In the first place, whatever their past reluctance, the other six vendors have all started taking Unix a great deal more seriously.

Under the new organizational structure, IBM's AIX people in Austin, Texas, are clearly making a genuine effort to offer a real IBM Unix product. HP's Spectrum models, offering Unix before HP's own proprietary operating system was ready, have clearly sold far better with Unix than HP expected.

Honeywell Bull, Siemens and Nixdorf have all begun to make Unix a key part of their future strategy. All appear to recognize that they cannot survive on proprietary architectures indefinitely. Even DEC, although still more reluctant than the others, has taken a far more favorable position toward Unix in recent months.

On the other hand, there is no denying that the recent arrangement between AT&T and Sun has an exclusive character that promises a far less level playing field regarding Unix than AT&T has always promised.

In this case, however, the struggle isn't likely to result in an apocalyptic conflict and the end of the world for Unix. On the contrary, there is a good chance that the warring factions will eventually kiss and make up on this one.

The AT&T and Sun deal appears to have been very much the work of Vittorio Cassoni, who has now left AT&T to return to Olivetti. The deal had an aggressiveness that isn't characteristic of AT&T's typically conservative management.

NONE OF THE sponsors of OSF has distinguished itself as a particularly warm and sincere supporter of Unix.

Chances are good that with Cassoni gone, we will see some sort of reconciliation between OSF and AT&T that will amount, in practice, to AT&T backing down on the deal with Sun — however face-saving the appearance might be. AT&T's present management isn't very likely to be as eager as Cassoni to charge off with a youthful companion like Sun down untrodden paths.

Zachmann is vice-president of research at International Data Corp.

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FROM PAGE 71

members. "I'm results oriented. In academia, the product is an idea or a paper about an idea. In the corporate world, it's something that people buy."

The seed Clark sowed at Stanford has borne fruit. Silicon Graphics made an initial public offering in October 1986, selling $18 million worth of common stock. In fiscal 1987, its first year as a public company, it reported net income of $5.6 million, or 45 cents per share, on revenue of $86.3 million.

Recently, Control Data Corp. announced plans to acquire 20% of Silicon Graphics for $68.9 million. CDC will also purchase $150 million worth of Silicon Graphics workstations during three years and will act as an OEM for the products, selling to CDC's own customers. CDC has particular success with customers interested in mechanical engineering applications, such as auto maker Volkswagen.

Silicon Graphics officials say CDC will not participate in the daily operations of their company. However, they concede that a $150 million customer carries significant clout.

"They'll have significant impact in our R&D activities — the same sort of influence that any $150 million customer would have," says Ed McCracken, Silicon Graphics' president, noting that one CDC representative will sit on his firm's six-member board of directors. "I don't think CDC has the intention to become involved with running Silicon Graphics. I think that's the reason they wanted a minority investment."

Three-dimensional graphics is where Silicon Graphics made its mark, and company officials insist they will not lose sight of that. Sophisticated graphics capabilities captured the attention of design-intensive companies like Boeing Co., McDonnell Douglas Corp. and Chrysler Corp. There are about 7,000 Silicon Graphics workstations currently being used by engineers and scientists.

"Our entire company and our entire energy is focused on this 3-D graphics world," McCracken says. "We're the Apple Computer of the 3-D marketplace. We're doing for 3-D graphics what the Macinstosh did for two-dimensional graphics. People have fun using the Mac and our Iris workstation."

Leading the pack

So far, Silicon Graphics has enjoyed a lead in its niche. Although others offer graphics workstations, Silicon Graphics has staked its claim at the high end of the market. And the new breed of computer, dubbed the "graphics supercomputer," launched by Ardent Computer Corp. and Stellar Computer, Inc., offers graphics comparable to Silicon Graphics' but at a significantly higher price.

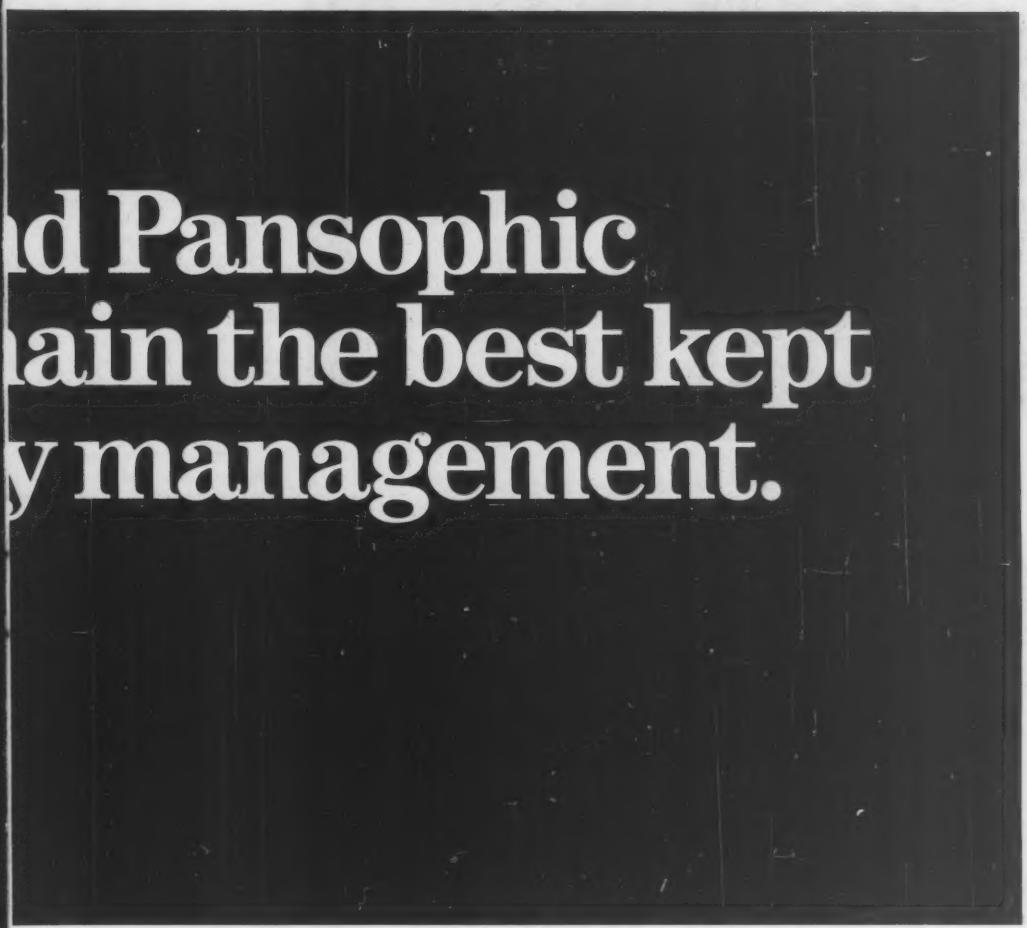
"They've captured the hearts and, more importantly, the pocketbooks of people who really care about high-performance graphics," says Robert Herwick, an industry analyst at Hambrecht & Quist, Inc.

Vic Galea, a project engineering manager at Chrysler, says his firm selected Silicon Graphics' Iris workstation for computer-aided graphics after an exhaustive nine-month search. The Silicon Graphics Iris 4D/60 was chosen over offerings from 23 other vendors.

"They offer the best performance for the price," Galea says. "That's the bottom line. Hewlett-Packard and Apollo were comparable from a graphics point of view, but Silicon Graphics was faster."

Silicon Graphics is looking to expand its niche, moving into the lower priced, $15,000 graphics workstation arena, where it will encounter more competition. Additionally, it is developing a parallel implementation of the reduced instruction set computing chip it buys from Mips Computers, Inc. that will allow it to enhance its computational ability to compete with Ardent's and Stellar's offerings.

Chief scientist Chesson perhaps best articulates Silicon Graphics' philosophy. "I don't need to rule the world," he maintains. "I'd much rather be proud of the things I make and be happy knowing that people are able to use them."



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Decision

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terface designs that make use of sound, animation, graphics and previously copyrighted material — images in compact disk/read-only memory data bases, for example. Such projects bring together the creative efforts of many authors.

Although conceding that multiple registrations would be administratively more difficult than single registrations, Apple's lawyers said the industry has no choice in the matter.

Dissimilar code can produce identical screen displays, according to David L. Hayes, an attorney with Fenwick, Davis and West, a Palo Alto, Calif., law firm that represents Apple.

"Suppose a [software maker] produces an authorized and wholly original computer program that produces screen displays indentical to those copyrighted by [another maker]," Hayes said. "With a policy of single registration, how is the second program to be registered — as a derivative work, or as an original work? To the extent you have independent authors, you must have multiple registration."

Current copyright law provides protection for seven categories of works. Software producers have traditionally sought protection under the literary works category.

When video games came on the scene in the mid-1970s, however, pirates duplicated screen displays with original code. As a defense, video vendors sought additional legal protection for the displays under the audiovisual works category.

Two copyright registrations for a single work was contrary to the policy of the Copyright Office, but for the video game products, the office made an exception.

Then, last year, a court decision involving a company that had two separate registrations for a single product threw the office's policy into confusion. DCA had gained copyrights on both program code and a particular screen display for its Crosstalk data communications software. The Crosstalk display was entirely textual and was registered, as was the program code, under the literary works category.

But the dual registration was granted by a mid-level examiner and was not consistent with official policy, according to Dorothy Schrader, general counsel of the Copyright Office.

Nevertheless, in a suit over alleged copyright infringement by Softklone's Mirror product, DCA won its case based on the screen-display registration.

By suggesting that textual screen displays could gain protection only through an additional registration, this decision, in effect, narrowed the software copyright protection of single registrants. Claimants who had made only single registrations were now at risk.

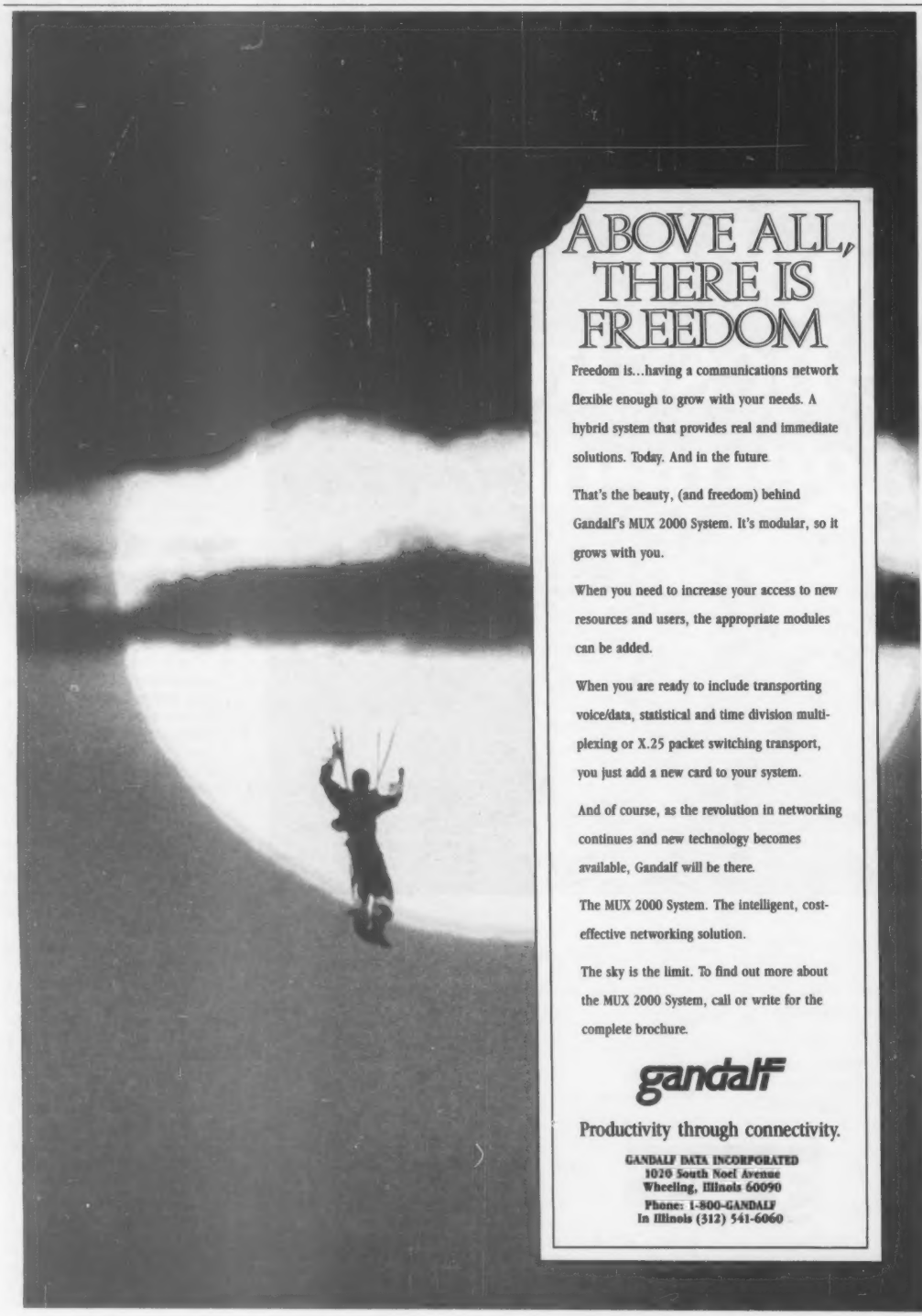
This state of affairs compelled the Copyright Office to re-evaluate its policies on copyright and, ultimately, to hold the public hearing.

Display registry

According to Schrader, the Copyright Office faces four choices in establishing new practices for registration of computer screen displays:

- Unitary registration. Only one registration could be made for computer program or code authorship and any related computer-generated displays.
- Mandatory separate registration. Separate registration would be required for computer program authorship and for any computer-generated screen displays if copyright is claimed in the displays.
- Optional registration. The claimant would have the option to make a single, unitary registration for the computer program and the screen or could register them separately.
- Interface screen registration. The claimant must claim any copyright in user interface screens as part of the claim in the computer program but could elect to register separately any screen displays that are not user interface screens.

Byles is a Long Beach, Calif.-based information industry journalist and a consultant on Asian markets.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Picking tomorrow's hot fields

A simple technique can guide you through the emerging technologies maze

BY SHERYL KAY
SPECIAL TO CW

Tracking new information systems technologies to identify the ones that will become hot fields can be one key to career planning.

Sifting through the abundance of new technologies to separate the winners from the flashes in the pan may seem an ominous task, but it need not be.

To begin, create a simple planning chart — a table of rows and columns — and label the columns with the names of the technologies you think will come into wide use.

Potential sources

Label the rows for sources of information to monitor: university centers, trade shows, the military, the financial community, research groups and personal tours.

For a preliminary screening of the technologies — before pursuing these sources — track them in reputable technical publications. Those technologies that have received positive coverage for six months or so are the technologies most likely to merit further investigation.

A place to start investigating the technologies that pass this test is in university labs. "Becoming affiliated with two or three key universities, where their projects are developing technologies that will impact businesses you may be interested in, is an excellent investment," says Bruce Wilson, director of advanced technology strategic planning at Seattle-based Boeing Computer Services.

Attending trade shows and conferences, especially those open to many vendors, will further your perspective, Wilson says. "Major producers that have the know-how are at these shows and conferences," he says. "You're now past the 'gee-whiz' stage of the early newsletters and journals and can begin to understand what will happen when the rubber hits the road."

David Rippetoe, a retired U.S. Air Force general who is now an associate at Computer Technology Planning, Inc. in Tampa, Fla., points out how following military expenditures also can be important.

'Our best minds'

"In 1963, the Air Force began a four-month study called Project Forecast One where 300 of our best minds sat down to plan for the new technologies of the next 20 years. A great deal of that study became reality, like advanced radar technology," Rippetoe says.

"Project Forecast Two was just completed last year to take us into the 21st century," he continues. "Most of the study is in the public domain. By monitoring how industry responds to these military technical demands, a technician will see which technologies are the wave of the future."

Wall Street analysts may not have had the best of times for the past eight months, but when they speak, people still listen.

Market analysts might help you determine which vendors are financially well-positioned for the future as well as which industries are expanding and therefore require more automation.

"We must now be concerned with the total global picture on how financial decisions are made, because the impact on technology is now worldwide," says Bob Malik, a vice-president for corporate technology at The Travelers Corp. in Hartford, Conn., who monitors the financial community.

Another option is to interview those market research firms that follow information technology. Although these firms often sell reports for hefty fees, a representative may be willing to answer specific questions.

> "DEVELOP AN attitude to deal with the changes, because even the best predictors may have trouble keeping up with all of the technologies that might be hot in the future."
>
> SANDY GINNIS
> THE TRAVELERS CORP.

The last category may be the most difficult to pursue. If a systems professional has the ability to see some of the technologies in action — or even better, to see how they are being updated — the picture of the future becomes even more fine-tuned. If possible, perhaps through a business acquaintance, try to arrange for tours of companies, seeing both users and vendors.

Every time one of the technologies receives emphatic reviews from one of the information sources, place a check mark in the appropriate space. It soon becomes evident what the authorities think, and a generally positive consensus in any column will be a moderate-to-good indication of a technology that is here to stay.

Words to the wise

A few cautionary words are in order before you change your career path, however. The Travelers' Malik says a systems professional "must have an understanding of where the business plan of the potential employer is going and view the technology in that light."

Don't look at each technology as though it stands alone. "Technology, by itself, driving a business, is just not correct and can be very misleading," according to Malik.

Furthermore, approach the results with a certain tolerance for ambiguity, advises Sandy Ginnis, director of data processing education and development at The Travelers.

"Despite the utilization of all of these sources," Ginnis says, "you must develop an attitude to deal with the changes, because even the best predictors may have trouble keeping up with all of the technologies that might be hot in the future."

Finally, know yourself, Rippetoe advises. "It's very important to look inside yourself," he says. "There may be a lot of new technologies out there, but because of your own skill, only certain ones may be right for you."

Kay is an MIS human resources consultant based in Tampa, Fla.

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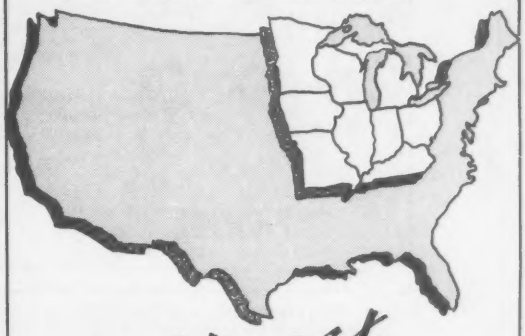

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Academic Computing

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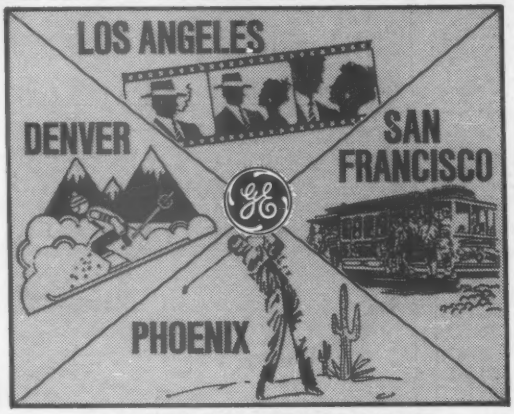

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MARKETPLACE

Steady trading dominates

Compaq users choose to upgrade within line; IBM PC demand met

BY CAMERON HALL
BOSTON COMPUTER EXCHANGE CORP.

The secondary market was active during the week ending May 27, with most systems maintaining price levels in steady trading.

The IBM Personal Computer AT Model 339 and the Compaq Computer Corp. Deskpro 386 were readily available after suffering shortages in recent weeks, but the IBM Personal System/2 Model 80 and the Apple Computer, Inc. Macintosh II continued in short supply.

The IBM market slowed from the trading frenzy of recent weeks as demand for PC- and AT-based machines was met with a ready supply of equipment. Large quantities of these machines are becoming available, with many inquiries about summer delivery of machines being outplaced by corporations upgrading to PS/2 machines.

Up, up and away

Increased interest in the PS/2 models raised prices, with the Model 50 trading at May 20's higher price of $2,400 and the PS/2 Model 60 up $50 to close at $2,650.

The PC XT Model 089 and the AT Model 339 were both down after the highs of recent weeks and were readily available at $1,525 and $3,400, respectively. The most common configuration for the AT available for sale on the Boston Computer Exchange is now an IBM Enhanced Graphics Adapter color system rather than the monochrome system of the past.

In the Compaq market, prices on the popular Deskpro 286 and 386 machines held their own in active trading after dropping in price the week prior. Sellers in this market were upgrading to faster machines within the Compaq line rather than selling, because they had no use or were switching to other manufacturers' models.

> DEMAND from summer session students heated up a generally slow market for the Macintosh 512E, with all sellers satisfied at the closing price of $925.

Buyers experienced savings of up to $1,000 over new discounted prices, with the Deskpro 286 with 40M-byte drive trading at $2,550 against prices of up to $3,600 for new systems, and the Deskpro 386 with 40M-byte drive closing at $3,975 for systems selling discounted new at $4,900.

Demand was off considerably for the early Compaq Portable and Plus machines, with the Portable I losing its place as the most actively traded to the Macintosh Plus.

Ripe market

The Apple market was the most active this week, with most trading in the Mac Plus and 512E lines. The Plus was the machine of the week, as the previous week's drop in price to $1,075 increased the quantity of machines traded and prices remained unchanged this week.

The 20M-byte Plus systems finally yielded to the downward price pressure of recent weeks and fell $150 to $1,600, a more realistic price compared with the price of the floppy disk-based Plus.

Demand from summer session students heated up a generally slow market for the Macintosh 512E, with all sellers satisfied at the closing price of $925. Supply of the Mac SE models is still not able to meet demand.

Computer systems configured with 1M byte or more of random-access memory are beginning to command premium prices.

The BoCoEx Index

Closing prices report for the week ending May 27, 1988

	Closing price	Recent high	Recent low
IBM PC Model 076	$825	$850	$550
XT Model 086	$1,150	$1,200	$875
XT Model 089	$1,525	$1,550	$1,100
AT Model 099	$2,300	$2,425	$1,750
AT Model 239	$2,600	$2,650	$2,125
AT Model 339	$3,400	$3,500	$2,625
PS/2 Model 50	$2,400	$2,500	$2,225
PS/2 Model 60	$2,650	$2,650	$2,475
Compaq Portable I	$800	$825	$525
Portable II	$2,275	$2,375	$1,650
Portable III	$2,775	$2,775	$2,300
Portable 286	$2,175	$2,250	$1,675
Plus	$1,100	$1,150	$750
Deskpro 20-MHz	$1,500	$1,525	$975
Deskpro 286	$2,550	$2,625	$1,925
Deskpro 386	$3,975	$4,000	$3,675
Apple Macintosh 512	$700	$750	$575
512E	$925	$1,025	$650
Plus	$1,075	$1,100	$810
Plus 20-MHz	$1,600	$1,650	$1,350
SE	$1,925	$2,100	$1,600
SE 20-MHz	$2,400	$2,500	$2,050
II	$4,025	$4,325	$3,500
NEC Multispeed EL	$1,050	$1,100	$750
Toshiba T1100+	$1,050	$1,125	$800
Toshiba T5100	$4,850	$4,900	$4,750

INFORMATION PROVIDED BY THE BOSTON COMPUTER EXCHANGE CORP.

The BoCoEx Index prices are based on configurations of complete systems with a monochrome monitor and adapter, but less the value of any software or other peripherals. The Boston Computer Exchange can be reached at 1-800-262-6399.

'Silverlake syndrome' affects 5360 prices

BY TONY MEMBRINO
IDC FINANCIAL SERVICES CORP.

General industry belief has June pegged as the anticipated month in which IBM will announce its long awaited System/36 and 38 follow-on, widely known as Silverlake.

As the impending Silverlake unveiling approaches, it appears that many System/36 users are taking a wait-and-see attitude. Thus, activity on the System/36 used market has slowed down.

Overall, it appears that System/36 users are aware that Silverlake will be based on a different architecture, and thus they are somewhat cynical of what this machine will truly offer.

Factors such as software conversion costs, performance and pricing are significant issues to be resolved before they will make any Silverlake acquisition decisions.

From November 1987 through April 1988, System/36 processors such as the IBM 5360 B models have seen a significant decline in value. In November, a B23 Stage 1 model retailed at 50% of list price, or $20,300. By April, the B23 had fallen to 33%, or $13,398.

Long lead times

The primary reason for this decline was the long lead time on IBM's $6,000 Model B to D upgrade. As a result of these lengthy lead times, users began swapping out their Model Bs and purchasing Model Ds outright.

This led to an oversupply of Model Bs on the secondary market, and used values fell.

IDC Financial Services Corp. research indicates that since April, Model B values have begun to stabilize. Currently, the B23 Stage 1 retails at 33% of list price, and the B24 Stage 1 is trading at 44%.

Stabilization

Third-party contacts say a combination of factors has contributed to the stabilization of B values. These include the following:

- B users have retained their machines in anticipation of prices dropping on higher end System/36 models after Silverlake is announced.
- Dealers have acquired Model B machines for the 200M-byte drive, thus drying up supply.
- The realization by System/34 users that 5360 B models have become bargain machines on the secondary market.

IDC Financial Services has also heard speculation that lead times on IBM Model B to D upgrades are shortening. If this is the case, some users will hold on to their 5360 B machines and upgrade to D models, thus contributing to the decreasing supply of B models. This action could also result in D machines reaching the used market prematurely and causing D values to drop.

While System/36 activity has been slowing on the used market, the 5363 has added new life to the System/36 line.

Since its announcement in October 1987, demand has gone unabated. While lead times of up to eight weeks are not unheard of from IBM, third-party dealers are able to obtain these machines for users in a more timely fashion. In addition, a user can expect to get these machines new from third-party dealers at 10% to 15% off of list price.

Some of the attributes that make the 5363 so successful include its low entry price, wide selection of software, low maintenance costs and ease of use.

According to third-party contacts, most of the users who have acquired 5363 models are not new users but past IBM 5362, 5364 or 5360 A model users. System/34 users are also finding this box an attractive buy.

For more information, contact IDC Financial Services' Terri LeBlanc at 617-872-8200.

IBM System/36 processors

Current retail fair market value

	Date shipped	IBM base list price	Percent of list price
5360 B23 Stage 1	July 1983	$40,600	33%
B24 Stage 1	July 1983	$55,100	44%
5363 P10	October 1987	$10,000	*
P20	October 1987	$ 11,100	*

* Currently not available on the secondary market

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Copies of the RFP will be available for distribution on May 24, 1988, in Rm. 610, 250 Broadway, New York, N.Y. 10007. Proposals must be submitted to the Authority in the form specified in the RFP, by 4:00 P.M. on June 21, 1988.

Inquiries should be directed to Mr. Robert Doen, Esq., Deputy General Counsel, Rm. 623, 250 Broadway, New York, New York 10007, (212) 306-4090.

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A proposers' conference will be held at 10:30 A.M. on Monday, June 20, 1988, in the 8th floor conference room, at 250 Church Street, New York, N.Y.

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BY SHARON BAKER
CW STAFF

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PC training is being provided by commercial networks operated by universities or other parties, which typically broadcast academic courses in advanced technologies, as well as by private, internal networks operated by large corporations.

The University of Southern California's 16-year-old Instructional Television Network is an example of the approach many universities have embarked on to provide graduate-level computer science and engineering programs to busy professionals.

The network beams courses for USC master's degree programs via microwave to corporate subscribers within 70 miles of the Los Angeles campus and to four public classroom facilities.

Also, the network carries non-credit courses on technical and management topics ranging from Ada programming to stress reduction.

The network acquires some of the non-credit programs from commercial training vendors or other universities and produces some itself, according to program coordinator Raymond Fujioka.

Courses save travel

The chief advantage of televised education and training is the convenience of avoiding travel, according to Mary Ehrlich, manager of human resource development at Aerojet Electro Systems, Inc. in Azusa, Calif., which is a major user of USC's network.

The university charges students its regular tuition fees for courses taken for degree credit, plus a $75 surcharge that covers delivery of homework. Non-credit courses, ranging from one to 23 sessions, can be free or cost as much as $300 per student. Company discounts are available.

The USC network rebroadcasts academic classes for students who miss them and queries users to identify topics for non-credit classes, Ehrlich says.

"They feel out the organizations and watch those critiques and know what the hot subjects are," she says.

During the past year, organizations such as Aerojet began expressing an interest in software training for personal computers, Fujioka says.

> "I THINK televised training is a very effective way to get a message out to a large number of people that is consistent."
>
> BILL EDWARDS
> EASTMAN KODAK CO.

As a result, the network offered courses on Microsoft Corp.'s MS-DOS, Ashton-Tate Corp.'s Dbase III Plus and Lotus Development Corp.'s 1-2-3. The programs used by USC were designed by New York-based Microvideo Learning Systems.

The televised PC training is for passive viewing; students do not work at a keyboard as they watch, Ehrlich says. But the students find the overviews valuable, she adds.

Lack of interaction between students and instructor is a commonly cited drawback of much televised training.

"If a student does not understand the lecture, he can't ask the instructor what he was talking about," Fujioka says.

To offset that drawback, the internal satellite television network operated by Eastman Kodak Co. includes a telephone link that allows those on the receiving end to call in with questions.

Last November, for the first time, the company used the network to carry PC training — a live, two-hour program providing new users an overview of the PC.

"Kodak uses this [network] almost daily for updating their sales and service and marketing people throughout the U.S.," says Bill Edwards, coordinator of end-user and personal computing at Kodak.

The PC program, broadcast from Kodak's Rochester, N.Y. studio to 60 remote sites nationwide, was conducted by Logical Operations, Inc., a PC training firm also based in Rochester that provides training services for about 150 companies.

Harvey Feldstein, director of sales and marketing at Logical Operations, says he knows of only one other corporation that provides PC training through an internal television network. "I would say it's quite innovative," he says of Kodak's approach.

The human touch

Feldstein admits that even a live instructor with a call-in feature has its drawbacks.

"We think that people learn best with a live, warm human person, not only to answer their technical needs but also address their human needs," Feldstein says. "That becomes difficult in this kind of training because the instructor can't see the students — he can't see them responding to this type of training."

But Kodak offered the PC program via satellite to provide interaction between the instructor and students while ensuring consistency in its training. With 60 sites around the country, it is often difficult to be consistent when relying on local vendors, Edwards says. "I think it's a very effective way to get a message out to a large number of people that is consistent."

Edwards acknowledges that an internal network, which might cost several million dollars to build, is a viable option only for large organizations.

"You'd have to have a very large critical mass to make that work," he says.

Baker is a *Computerworld* copy editor.

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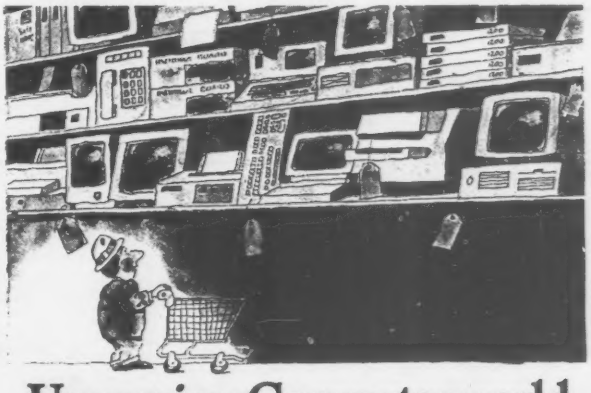

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Aug. 8	IBM Midrange Software (System 3/X)	July 22
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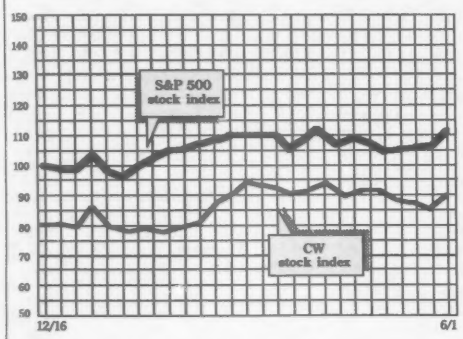

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Communications	93.9	97.9
Computer Systems	97.1	100.3
Software & DP Services	93.6	98.0
Semiconductors	59.2	69.1
Peripherals & Subsystems	79.6	82.4
Leasing Companies	120.7	126.2
Composite Index	85.6	90.8
S&P 500 Index	106.0	111.5

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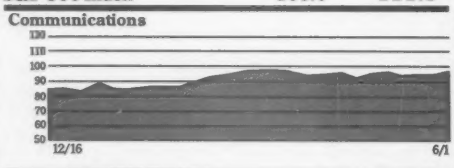

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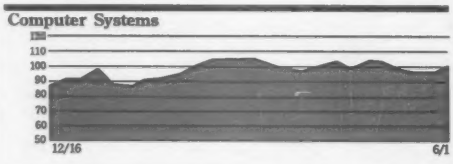

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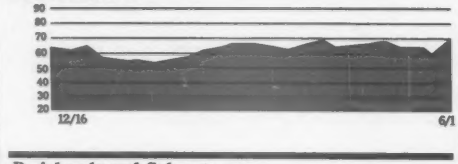

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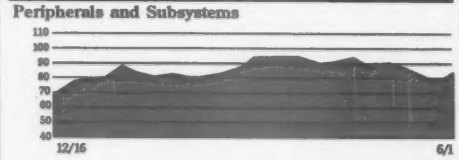

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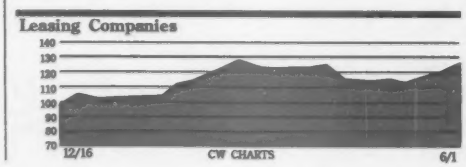

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EXCH		52-WEEK RANGE (1)		PRICE CLOSE JUNE 1 1988	WEEK NET CHNGE	WEEK PCT CHNGE
Communications and Network Services						
N	AMERICAN INFO TECHS CORP	100	74	91.88	4.1	4.7
Q	ANDREW CORP	18	11	15.00	0.5	3.4
Q	ARTEL COMM CORP	3	1	2.13	0.6	41.7
N	AT&T	36	20	27.75	1.3	4.7
Q	AVANT GARDE COMP INC	6	2	2.00	-0.1	-5.9
Q	AVANTEK INC	17	6	6.88	-0.3	-3.5
N	AYDIN CORP	35	16	19.50	-0.4	-1.9
N	BELL ATLANTIC CORP	80	61	72.88	4.4	6.4
N	BELLSOUTH CORP	44	29	41.88	2.3	5.7
Q	COMPRESSION LABS INC	6	2	3.75	-0.1	-3.2
O	COMPUTER NETWORK TECH	5	1	1.31	0.0	-2.3
O	CONTEL CORP	40	25	32.25	1.3	4.0
Q	DATA SWITCH CORP	10	4	7.50	0.8	12.0
Q	DIGITAL COMM ASSOC	49	20	32.63	0.5	1.6
Q	DYNATECH CORP	33	14	20.25	0.5	2.5
Q	FIBRONICS INTERNATIONAL INC	7	2	3.50	0.4	12.0
Q	GANDALF TECHNOLOGIES	10	5	7.25	0.2	2.6
Q	GENERAL DATACOMM INDS	13	3	3.63	0.0	0.0
N	GTE CORP	45	29	37.75	2.4	6.7
Q	INFOTRON SYS CORP	14	5	12.50	-0.5	-3.8
N	ITT CORP	66	42	48.38	2.5	5.4
N	M A COM INC	16	7	10.63	0.9	9.0
Q	MCI COMMUNICATIONS CORP	15	6	14.00	0.5	3.7
Q	MICOM SYS INC	17	7	15.50	0.3	1.6
Q	NETWORK EQUIPMENT TECH INC	28	12	18.00	0.8	4.3
Q	NETWORK SYS CORP	13	7	9.75	0.3	2.6
N	NORTHERN TELECOM LTD	24	14	17.63	1.0	6.0
Q	NOVELL INC	30	12	23.75	0.9	3.8
N	NYNEX CORP	78	58	66.13	3.9	6.2
N	PACIFIC TELESIS GROUP	34	23	30.50	1.4	4.7
N	PARADYNE CORP	9	4	4.25	0.0	0.0
A	PENRIL CORP	5	1	4.38	-0.3	-5.4
N	PLESSEY PLC	38	23	28.75	-0.8	-2.5
N	SCIENTIFIC ATLANTA INC	20	8	13.88	1.5	12.1
N	SOUTHWESTERN BELL CORP	46	22	38.13	1.9	5.2
Q	3 COM CORP	26	12	18.88	-1.0	-5.0
Q	UNGERMANN BASS INC	15	5	12.25	0.0	0.0
N	U S WEST INC	60	43	55.13	2.4	4.5
Computer Systems						
Q	ALLIANT COMPUTER SYS	33	5	5.75	-0.3	-4.2
Q	ALPHA MICROSYSTEMS	6	3	6.00	0.3	4.3
Q	ALTOS COMPUTER SYS	15	9	8.63	0.0	0.0
A	AMDAHL CORP	50	19	48.00	3.1	7.0
O	APOLLO COMPUTER INC	25	9	15.63	1.3	8.7
O	APPLE COMPUTER INC	60	28	42.50	3.6	9.3
N	BOLT BERANEK & NEWMAN	25	12	16.25	0.3	1.6
Q	BRITTON LEE INC	4	1	2.00	-0.1	-3.1
N	COMPAQ COMPUTER CORP	79	34	52.00	3.1	6.4
Q	COMPUTER AUTOMATION INC	16	6	8.75	0.4	4.5
A	COMPUTER CONSOLES INC	10	2	7.38	0.1	1.7
Q	CONCURRENT COMP CORP	24	11	17.00	0.0	0.0
N	CONTROL DATA CORP DEL	38	18	25.38	0.8	3.0
Q	CONVERGENT TECH	9	3	3.19	-0.1	-1.9
N	CONVEX COMPUTER CORP	18	6	8.00	0.5	6.7
N	CRAY RESH INC	119	47	79.13	4.0	5.3
Q	DAISY SYS CORP	11	5	10.25	1.1	12.3
N	DATA GEN CORP	37	16	22.00	0.8	3.5
N	DATAPOINT CORP	9	3	5.63	-0.1	-2.2
N	DIGITAL EQUIP CORP	200	99	105.88	3.5	3.4
N	FLOATING POINT SYS INC	12	3	2.75	-0.3	-8.3
N	GOULD INC	34	8	14.38	0.3	1.8
N	HARRIS CORP	41	22	28.00	0.1	0.4
N	HEWLETT PACKARD CO	74	36	58.00	2.1	3.8
N	HONEYWELL INC	91	49	70.50	2.8	4.1
N	IBM	178	102	113.13	3.9	3.5
Q	INFORMATION INTL INC	15	9	12.63	0.4	3.1
Q	IPL SYS INC	3	1	1.75	0.0	0.0
Q	MASS COMPUTER CORP	14	4	4.25	-0.1	-2.9
N	MATSUSHITA ELEC INDL LTD	228	103	205.00	-3.0	-1.4
Q	MEGADATA CORP	6	3	3.13	0.0	0.0
Q	MENTOR GRAPHICS CORP	39	14	31.25	2.0	6.8
N	NBI INC	14	4	4.88	-0.4	-7.1
N	NCR CORP	87	42	61.38	1.3	2.1
N	PRIME COMPUTER INC	31	12	16.50	0.8	4.8
O	PYRAMID TECHNOLOGY	14	5	12.00	0.8	6.7
Q	STRATUS COMPUTER	40	15	29.25	1.5	5.4
Q	SUN MICROSYSTEM INC	45	14	34.25	1.3	3.8
Q	SYMBOLICS INC	5	1	1.44	0.0	0.0
O	SEQUENT COMPUTER SYS INC	23	9	18.50	0.4	2.1
N	TANDEM COMPUTERS INC	37	16	18.13	0.5	2.8
N	TOSHIBA CORP	57	28	47.13	2.5	5.6
N	ULTIMATE CORP	37	12	13.00	-0.1	-1.0
N	UNISYS CORP	48	24	34.50	1.0	3.0
A	WANG LABS INC	19	10	10.63	0.3	2.4
Software & DP Services						
Q	ADVANCED COMP TECH	6	1	1.13	-0.1	-10.0
N	AGS COMPUTERS INC	30	11	23.50	1.9	8.7
Q	AMERICAN MGMT SYS INC	20	9	16.00	1.9	13.3
Q	AMERICAN SOFTWARE INC	19	6	13.38	0.4	2.9
N	ANACOMP INC	11	4	10.25	0.5	5.1
Q	ANALYSTS INTL CORP	10	4	7.88	-0.4	-4.5
Q	ASHTON TATE	33	13	27.50	3.0	12.2
Q	ASK COMPUTER SYS INC	16	6	14.00	0.9	6.7
Q	AUTODESK INC	34	12	29.00	2.5	9.4
N	AUTO DATA PROCESSING	55	16	40.00	2.4	6.3
Q	BOOLE & BABBAGE INC	12	5	9.25	0.3	2.8
N	COMPUTER ASSOC INTL INC	37	15	27.25	2.1	8.5
Q	COMPUTER HORIZONS CORP	15	7	9.88	0.8	8.2
N	COMPUTER SCIENCES CORP	73	38	41.50	1.3	3.1
N	COMPUTER TASK GROUP INC	17	9	10.63	0.4	3.7
Q	COGNOS INC	17	4	6.50	0.0	0.0
Q	COMSHARE INC	28	12	16.13	0.6	4.0
N	CULLINET SOFTWARE INC	14	4	7.75	0.4	5.1
Q	DUQUESNE SYS INC	28	10	19.75	1.0	5.3
A	DATA ARCHITECTS INC	16	7	13.75	0.0	0.0
N	GENERAL MTRS (CLS E)	51	30	42.63	1.6	4.0
Q	HOGAN SYS INC	16	4	4.38	0.3	6.1
Q	INFORMIX CORP	31	12	18.50	1.3	7.2
Q	INTELLICORP INC	11	2	2.75	0.0	0.0
Q	KEANE INC	16	6	11.50	0.0	0.0
Q	LOTUS DEV CORP	40	19	22.75	1.3	5.8
Q	MANAGEMENT SCI AMER	15	6	8.75	0.5	6.1
Q	MICRO PRO INTL CORP	7	3	2.56	-0.3	-9.9
Q	MICROSOFT CORP	79	37	59.25	2.5	4.4
Q	MORINO ASSOCIATES INC	22	7	16	0.3	1.6
Q	NATIONAL DATA CORP	34	20	24.75	2.9	13.1
Q	ON LINE SOFTWARE INTL INC	22	9	8.88	0.1	1.4
Q	ORACLE SYS CORP	19	8	17.13	1.5	9.8
N	PANSOPHIC SYS INC	28	11	14.50	0.0	0.0
Q	POLICY MGMT SYS CORP	30	15	24.00	0.5	2.1
Q	PROGRAMMING & SYS INC	14	7	11.75	0.3	2.2
Q	REYNOLDS & REYNOLDS CO	38	14	17.75	0.8	4.4
Q	SEI CORP	19	10	17.63	0.5	2.9
Q	SHARED MED SYS CORP	30	19	22.00	1.3	6.0
Q	SAGE SOFTWARE INC	19	5	5.75	0.0	0.0
Q	SOFTWARE PUBG CORP	18	5	17.13	0.1	0.7
A	STERLING SOFTWARE INC	12	6	7.13	-1.3	-14.9
Q	SUNGARD DATA SYS INC	20	10	16.75	-0.3	-1.5
Q	SYSTEMATICS INC	33	19	31.25	-0.3	-0.8
N	SYS. SOFT INC.	24	7	14	-0.3	-1.7
Q	VM SOFTWARE INC	30	7	13.25	-0.3	-1.9
Semiconductors						
N	ADV MICRO DEVICES INC	25	8	15.63	1.1	7.8
N	ANALOG DEVICES INC	24	8	15.13	1.4	10.0
Q	ANALOGIC CORP	13	5	8.63	0.0	0.0
Q	INTEL CORP	42	18	31.25	1.6	5.5
Q	LSI LOGIC CORP	15	7	12.00	1.0	9.1
N	MOTOROLA INC	74	35	46.25	1.1	2.4
N	NATL SEMICONDUCTOR	22	10	14.00	1.1	8.7
N	TEXAS INSTRS INC	80	36	45.88	2.5	5.8
A	WESTERN DIGITAL CORP	30	11	15.38	0.6	4.2
Peripherals						
Q	ALLOY COMP	13	3	3.00	0.0	0.0
N	AM INTL INC	9	3	4.00	0.3	6.7
Q	AST RESH INC	31	6	12.75	-0.3	-1.9
Q	AUTO TROL TECH CORP	7	3	4.63	-0.1	-2.6
Q	BANCTEC INC	15	5	7.88	-0.1	-1.6
Q	CIPHER DATA PRODS INC	13	4	8.88	1.0	12.7
A	COGNITRONICS CORP	5	2	2.63	-0.1	-4.5
N	COMPUGRAPHIC CORP	28	19	27.00	0.4	1.4
A	DATAPRODUCTS CORP	24	7	9.50	0.1	1.3
A	DATARAM CORP	8	5	6.88	0.1	1.9
N	EASTMAN KODAK CO	71	39	43.00	1.9	4.6
Q	E M C CORP MASS	29	6	6.50	0.1	2.0
Q	EMULEX CORP	9	4	7.38	0.0	0.0
Q	EVANS & SUTHERLAND	35	17	17.00	0.3	1.5
Q	ICOT CORP	8	3	3.25	0.1	4.0
Q	INTERLEAF INC	24	11	15.75	1.6	11.5
Q	IOMEGA CORP	4	1	3.63	0.6	20.8
Q	LEE DATA CORP	8	3	3.75	0.8	25.0
Q	MASSTOR SYS CORP	6	1	2.88	0.0	0.0
Q	MAXTOR CORP	31	6	11.63	-0.3	-2.1
Q	MICROPOLIS CORP	42	13	23.50	2.3	10.6
Q	MINISCRIBE CORP	17	5	10.88	0.1	1.2
N	MINNESOTA MNG & MFG CO	84	45	62.63	4.1	7.1
A	MSI DATA CORP	19	8	13.75	0.5	3.8
Q	PERSONAL COMPUTER PRODUCTS INC	7	4	5.63	0.1	1.1
Q	PRIAM CORP	6	1	1.88	0.0	0.0
Q	PRINTRONIX INC	13	7	9.63	0.3	2.7
N	QMS INC	27	8	9.38	0.0	0.0
Q	QUANTUM CORP	23	8	10.75	1.0	10.3
Q	RAMTEK CORP	6	1	1.44	0.1	4.6
N	RECOGNITION EQUIP INC	22	7	7.25	0.6	9.4
Q	REXON INC	11	4	4.13	-2.9	-41.1
Q	SCAN TRON CORP	17	7	14.88	0.4	2.8
Q	SEAGATE TECHNOLOGY	44	10	17.63	0.9	5.2
N	STORAGE TECH CORP	5	1	1.63	0.0	0.0
Q	TANDON CORP	7	1	2.31	0.2	8.8
A	TEC INC	7	3	4.13	0.0	0.0
N	TEKTRONIX INC	41	21	25.13	-0.1	-0.5
Q	TELEVIDEO SYS INC	3	1	1.31	0.1	5.0
N	TELEX CORP	80	30	47.88	-1.0	-2.0
Q	WYSE TECH	40	11	18.38	0.5	2.8
N	XEROX CORP	86	50	52.38	1.0	1.9
Q	XIDEX CORP	15	5	5.50	0.3	4.8
Leasing Companies						
Q	CAPITAL ASSOCIATES INTER-NATIONAL INC	11	4	5.88	0.3	4.4
N	COMDISCO INC	37	12	21.13	1.4	7.0
N	CONTINENTAL INFO SYS	14	5	7.00	0.0	0.0
Q	PHOENIX AMERN INC	5	2	3.00	-0.1	-2.1
Q	SELECTERM INC	6	3	5.25	0.4	7.7

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL; O—OVER-THE-COUNTER; S—SPLIT

(I-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID)
(1) TO NEAREST DOLLAR

Crackle, pop

DEC arrives for breakfast, Compaq readjusts after slide

The dozing market of the past two weeks suddenly arose and headed toward the stars last week as the Dow Jones industrial average posted a 107-point midweek rally, snapping major computer issues out of their recent lethargy.

In a week shortened by the Memorial Day weekend, Digital Equipment Corp. posted the largest gain, shooting up 5½ points from a week earlier to close Thursday at 105⅝. Compaq Computer Corp. also ended a recent slide — with the help of a Salomon Brothers, Inc. report that raised its earnings forecast on the firm — and rose 4⅛ points for the three days of trading to 52¼.

In other action, IBM leapt 4⅝ points to 112⅝; Cray Research, Inc. rose 4 points to 78⅛; Microsoft Corp. gained 3½ points to 59; Ashton-Tate Corp. rose 2⅜ points to 26⅛; Amdahl Corp. was up 2⅜ points to 47½; and Software Publishing Corp. rose 2½ points to 19¼. On a sour note, however, SHL Systemhouse, Inc. fell 3 points to a 52-week low of 10¾ after Hambrecht & Quist, Inc. forecast a shortfall in revenue growth in the firm's government sector and lowered its recommendation.

JAMES DALY

HP augments 10M Ethernet line

BY PATRICIA KEEFE
CW STAFF

ROSEVILLE, Calif. — Hewlett-Packard Co. recently sweetened its previously announced 10M bit/sec. Ethernet offering with the introduction of HP Starlan 10 PC Link, a network adapter card said to cut costs by directly linking users to the unshielded telephone wire-based technology.

But it may not be enough to stave off even cheaper, more generic 10M-bit Starlan adapter cards from Micom-Interlan, Inc., TRW, Inc. and Kinetics Corp.

HP's initial approach consisted of a more expensive external device called the Medium Attachment Unit (MAU), which is used to link personal computers on a network to a wiring closet. It costs an additional $295 beyond the cost of the network adapter and software. Ungermann-Bass, Inc., 3Com Corp. and Digital Equipment Corp. all offer or have announced external MAU products as well.

The PC Link card is said to be compatible with Microsoft Corp. MS-Net-based software.

Micom-Interlan, TRW and Kinetics have all embedded 10M bit/sec. Ethernet technology from Synoptics Communications, Inc. in their Ethernet boards. In addition, those cards all come with software drivers supporting a host of network operating systems. The bundled product costs $495. PC Link comes with HP's Officeshare network software and costs $695.

"HP's card has a $200 premium in the market and is a proprietary card," said Michael Claire, Synoptics' vice-president of marketing and sales.

However, HP users can separately purchase Novell, Inc.'s Netware or 3Com's 3+ network software for use with the PC Link card, said Becky Magtsuoka, a product line manager with HP.

As for the pricing issue, Magtsuoka said PC Link's $695 list price "does not reflect the decoupling of Officeshare." She suggested the card, separately purchased, might cost somewhere between $395 and $595.

Perot

FROM PAGE 1

time expired Wednesday, and Perot unveiled Perot Systems Corp. Thursday at a Washington press conference.

Aiming high

The new company has an ambitious business plan to reach $100 million in annual profits within 10 years, according to McClellan. "To do that, it will take a lot of government megacontracts," he said. "I expect there will be heavy recruiting from EDS."

Six of the eight EDS executives at Perot Systems are from EDS's federal division, including Perot Systems President Patrick Horner, the division's top marketing manager.

In addition, Perot recruited three EDS corporate executives: Ross Reeves, vice-president of information processing; DeSoto Jordan, vice-president of corporate affairs; and Bruce Heath, vice-president of EDS operations at GM's Truck and Bus unit.

The Postal Service contract calls for a three-month study to determine potential DP cost savings, then a potential 10-year period for Perot Systems to implement systems. The profit will come from a unconventional shared savings plan with the Postal Service through a yet-to-be-determined formula.

Thursday's announcement caused heavy selling of EDS stock, which is traded as GM Class E. Shares dropped 2¾ points to 39⅞ on the New York Stock Exchange.

Delusion

FROM PAGE 1

Washington, D.C.

That is not what the founding fathers of IRM intended when they drafted the Paperwork Reduction Act of 1980, which was a mixture of IRM and paperwork control initiatives. The IRM philosophy views information as a valuable resource that must be managed from the beginning to the end of its life cycle, whether in electronic or paper form.

For example, this means keeping close tabs on the cost of information — from the design of a statistical survey to the time the final report is stashed on a dusty government shelf.

If frogs had wings . . .

Because it shifts attention from technology to the information itself, the IRM philosophy is supposed to bring together, under one management structure, such disparate areas as data processing, communications, libraries and records management.

But the theory, which some say was 15 years ahead of its time, has run smack into reality. Caudle's survey — the first ever done on IRM — reached the following conclusions:

- IRM is not well known or understood in most departments or bureaus. Managers are more comfortable with technology management than with information management.
- Most managers still consider information a "free good."
- Half of the IRM managers lack control over library services, and nearly one-third do not have control over records management or voice communications. Such non-DP functions are still considered to be administrative services or overhead.

The Commerce Department's Phillips

A 1986 report by the U.S. Congress's Office of Technology Assessment (OTA) came to similar conclusions. The researchers found that federal managers view the IRM concept as either an umbrella term meaning virtually the same thing as DP or as "an interesting and worthwhile concept, but much too broad to have substantial impact on down-to-earth problems."

In the latter category is Head, the former Agriculture Department official and now a consultant in Stafford, Va. It is fine to view information as a valuable resource, he said, but the real world requires specialists to manage computers and specialists to manage paperwork.

When the Agriculture Department's Office of Information Systems was transformed into the Office of Information Resources Management, Head recalled thinking: "Yesterday, you were a computer specialist. Today, you're an information resource manager. What are you going to do different today from what you did yesterday? The honest answer is, nothing."

A dissenter

At the other end of the spectrum is a strong supporter of IRM, Reed Phillips Jr., director of IRM at the U.S. Department of Commerce. He built the government's first IRM office when he was at the U.S. Department of the Interior and has watched in frustration as it has been dismantled [CW, Oct. 5, 1987]. The Reagan administration viewed IRM as a product of Democrats and thus paid it mere lip service, Phillips said. "I don't think this administration ever really supported the IRM concept."

The Reagan administration's position, as stated by the president's Office of Management and Budget (OMB), is that IRM "is simply a means to perform agency missions and is not an end in and of itself."

The U.S. General Accounting Office reported last year that agencies devote most of their energies to implementing the specific requirements of the Paperwork Reduction Act, such as naming a senior IRM official and conducting a systems inventory, rather than on the broad objectives of the act.

The Center for Information Technology's Keen

The act also requires five-year IRM plans and triennial IRM reviews, with oversight by the General Services Administration (GSA) and the OMB. The result is that federal IRM is more closely identified with red tape than with information management, the Caudle survey said.

The major incentive to comply with IRM directives is a "hammer" incentive: the rules must be followed in order to buy hardware and software, the report said. Consequently, managers at the bureau level consider IRM "a world of rules and restrictions, a maze to be gone through to obtain vital tools."

The good news is that the IRM program has improved strategic planning in the agencies, several experts agreed. "In large information-intensive agencies, IRM is part of the agency's strategic plan. In small information-intensive agencies, it *is* the agency's strategic plan," said Frank J. Carr, GSA's commissioner of IRM services.

As a practical matter, the IRM strategic plan serves the purpose of floating IRM programs up to superiors for approval and giving IRM visibility with top management, according to the Caudle report.

Furthermore, IRM experts said the convergence of computer and communications technology is helping break down the barriers to IRM. But full-scale adoption of IRM principles may require a new generation of managers who are not steeped in the old data processing traditions.

The IRM concept is still valid, according to Peter G. W. Keen, executive director of the International Center for Information Technologies, a Washington research center, but DP managers put in the role of IRM managers need to learn new analytical skills to understand the flow of information in an enterprise.

"It's the same thing with CIO. We've raised the DP manager in the hierarchy, but we haven't changed the thinking," Keen said. "We constantly relabel the status quo."

Donald A. Marchand, dean of the School of Information Studies at Syracuse University and one of the original gurus of IRM, said people should realize that IRM is evolutionary and will take more time to be fully realized.

Federal IRM managers must also cope with problems such as budget cuts, bureaucratic inertia and internal and external politics, the OTA noted: "As is probably true with any new (or relatively new) concept, as the concept moves from its guiding principles through the various stages of implementation, the broad philosophy becomes more and more distant."

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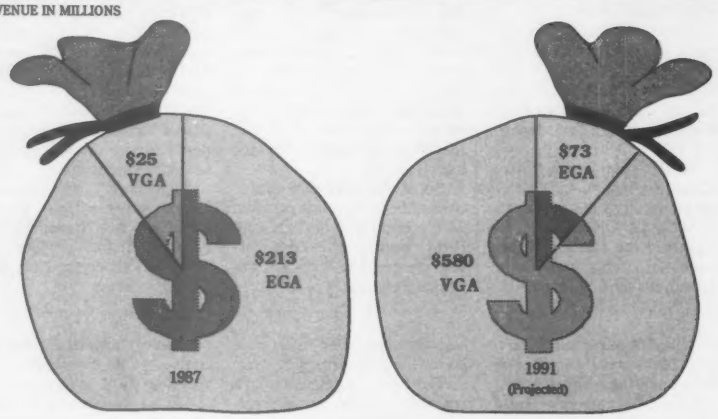
TRENDS

EGA vs. VGA

Upcoming VGA standard to capture graphics booty

REVENUE IN MILLIONS



Every three years comes a new IBM Personal Computer graphics standard. In 1981, with the unveiling of the PC, there was the Color Graphics Adapter (CGA), with 640- by 200-pixel resolution and a maximum of 16 colors available.

The Enhanced Graphics Adapter (EGA) was released in 1984. Offering 640- by 350-pixel resolution for 16 colors, it quickly became the industry standard. Many PC-compatible vendors expanded EGA beyond IBM's standard, such as NEC Corp. with its Multisync monitor technology.

Video Graphics Array (VGA), the current standard, was released with the introduction of the Personal System/2 family in April 1987 and improved on the EGA standard with 640- by 480-pixel 16-color resolution. VGA also tops its predecessors with more high-performance modes, such as the Multicolor Graphics Adapter mode of 320- by 200-pixel resolution with 256 colors.

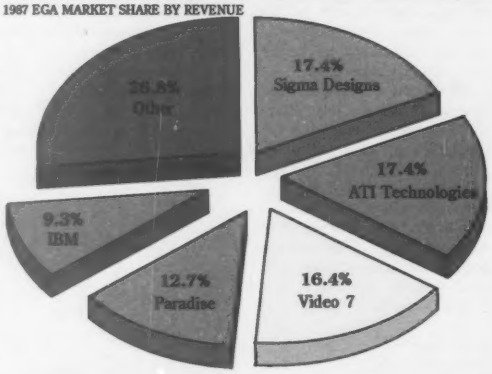
Because IBM has decreed VGA a standard — and because it offers more colors and modes and uses the less expensive analog monitor technology — the VGA aftermarket is expected to boom during the next several years.

VGA add-in boards for PCs and compatibles will greatly eclipse EGA in worldwide sales and shipments, increasing from a shipment level of 467,000 boards this year to 3.2 million in 1991, according to Joan-Carol Brigham, manager of graphics research at market research firm International Data Corp. in Framingham, Mass.

JAMES A. MARTIN

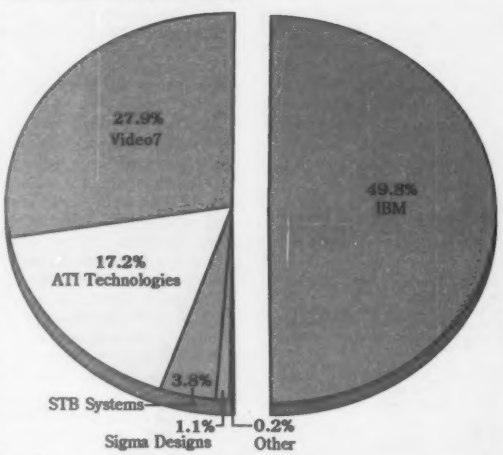
Current EGA treasure split several ways

1987 EGA MARKET SHARE BY REVENUE



IBM well poised to profit from VGA storm

1987 VGA MARKET SHARE BY REVENUE



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHARTS

INSIDE LINES

Dancing with the devil? Look for a communications-related announcement by Stratus Computer and IBM tomorrow. One industry consultant speculated that the announcement could involve tighter links for the IBM System/88 within IBM's Systems Network Architecture. Those systems are repackaged and relabeled versions of the Stratus XA 2000 processors. IBM's sales force reportedly affectionately refers to the 88 as the "Tandem-Killer" because Tandem machines are most frequently bid against that system. Meanwhile, the connection is becoming increasingly important for Stratus: IBM's resales accounted for 15% of Stratus's 1986 sales and for 25% in 1987; unconfirmed estimates put the current IBM portion much higher.

If at first you don't succeed . . . Wordtech Systems, which sold its SQL technology to Ashton-Tate and thus gave up all rights to the technology, has apparently hit the drawing board again. In a couple of weeks, the firm will announce versions of its DBXL, an Ashton-Tate Dbase workalike, and Quicksilver, its Dbase compiler; both support SQL. Meanwhile, Ashton-Tate continues to struggle to make the stuff it bought from Wordtech work. In a recent company newsletter, Wordtech argued that the technology it sold to Ashton-Tate took the wrong approach, so Wordtech was really better off dumping it anyhow.

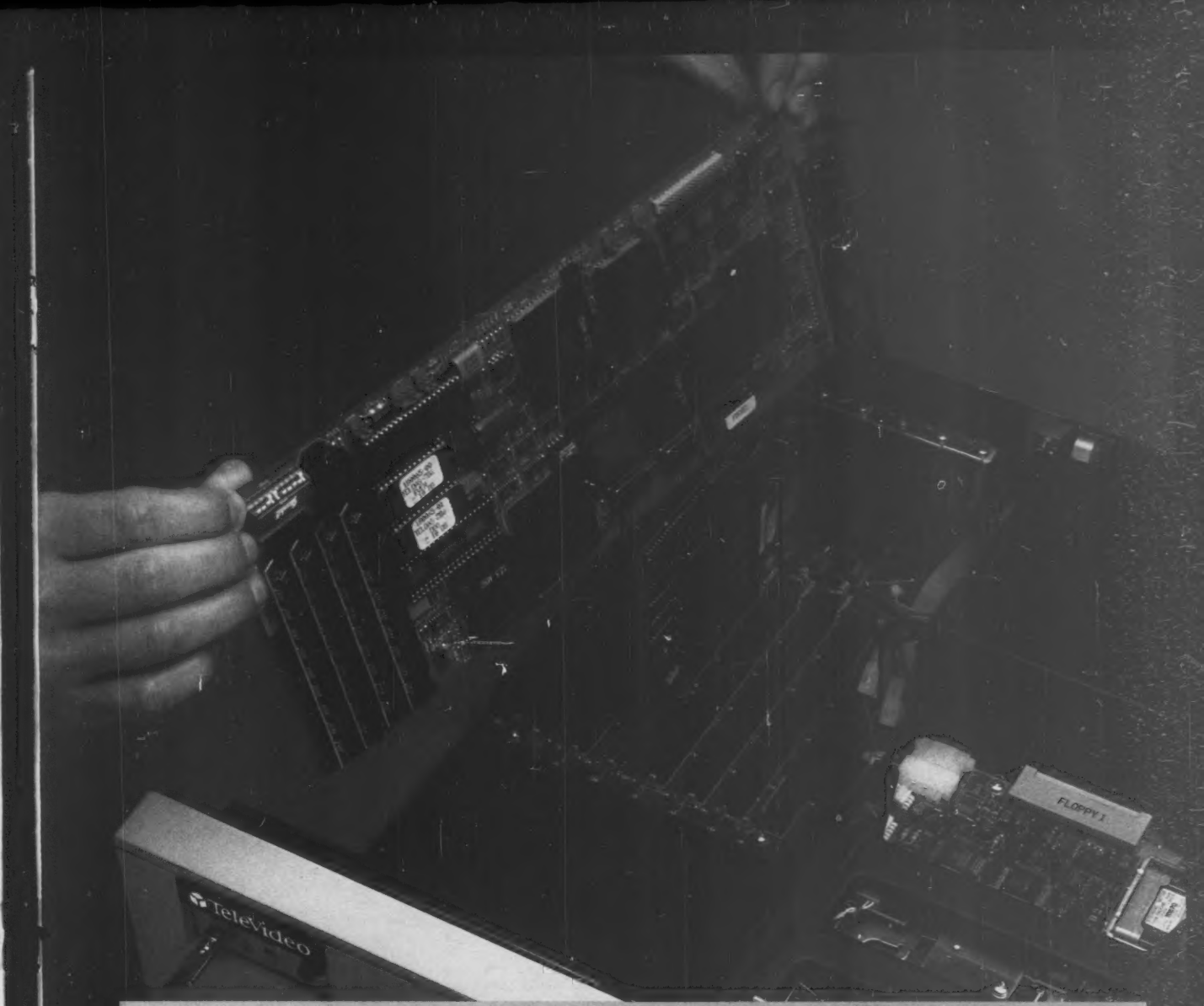
They sometimes comment on unannounced products. IBM, like most vendors, will be spending some time with Intel's soon-to-be-announced P9 80386 chip. "We will look at it and find a way to utilize it," said Nick Donofrio, vice-president of development for IBM's Entry Systems Division. The chip will have a 16-bit bus rather than the faster 32-bit bus of the current 386.

Ultimate Multimate? It looks like Ashton-Tate is trying to gather steam in the still-profitable word processing software market. The firm, which acquired market-leading Multimate as it apparently peaked, hopes for a boost with a summer beta test of Multimate Advantage III. Ashton-Tate's goal is the same as most other word processing vendors': to add features that eliminate the need for separate desktop publishing packages. Wonder if Ashton-Tate is worried about eliminating the need for Byline — its own desktop publishing software?

May the force be with them. A slew of third-party Appletalk and Macintosh developers reportedly will attend tomorrow's unveiling of the long-overdue version of Novell's Netware network operating system for the Macintosh environment. Sharing the podium will be Apple Chairman and Chief Executive Officer John Sculley. But don't look for the industry's most prominent developer of Macintosh applications. Microsoft, whose OS/2 LAN Manager rivals Novell's OS/2 strategy, is not expected to show. Ironically, the announcement will feature Novell demonstrating connectivity with OS/2 from a Mac — a long time before Apple enthusiasts and LAN Manager co-developer 3Com are expected to deliver the same capability, notes one industry wag.

Only the lawyers know for sure. Principals from the estranged suitors Network Equipment Technologies (NET) and Excelan met at least once last week in an effort to fan what appears to be a quickly dying ardor to consummate their plans to merge. It doesn't look good, according to one analyst who spoke with both companies following their attempt to salvage the relationship. "My indications [from those conversations] are that despite a sense of urgency, the meeting hasn't moved the two any closer to a resolution," he said, adding that it was further suggested that "another meeting would not be neccessary if the first one went in one [negative] direction." The analyst also characterized as "without substance" NET's charges that Excelan breached the merger agreement.

For the last 12 months, an IBM task force has been studying renaming its data base languages. No word yet on poetic justice, but the hot line is more than ready to collect suggestions. Feed your most appropriate candidates to News Editor Pete Bartolik at 800-343-6474 or 617-879-0700.



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